SCIENCE AND INDUSTRY

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1920—Thirty Years of Service to Construction—1950

Contractors and Engineers Monthly

Vol. 47, No. 1 JANUARY, 1950 $3 a Year, 50 Cents a Copy

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SCIENCE AND INDUSTRY

Covering the Field

- **Dealer Gives Service Plus**

  How? By treating contractors the way he'd like to be treated if *he* were a contractor. The story starts on this page.

- **Heads-Up County Work**

  The realistic county organization described on page 2 uses radio to speed work and plain talk to speed appropriations.

- **Buildings in Capital Cities**

  New York, capital of the world—steel framework for the U. N. Secretariat Building "tops out" at the 39th story (page 5).

  Des Moines, capital of Iowa—steel forms hurry concrete work for the new state office building (page 57).

- **Bridges Old and New**

  The $778,215 job covered on page 11 dressed an old concrete bridge up to 1950 standards and built a new one alongside.

- **Airport Runways Paved**

  The airport bituminous-paving story on page 17 also covers the fertilizing and seeding of field shoulders and slopes.

- **That Snow and Ice Problem**

  Page 21 discusses ice prevention in the Granite State.

  Page 65 tells how a district in the third-largest state in the nation tackles snow.

- **Concrete Trucked to Dam**

  As told on page 23, Dumpcretes toted 30,000 cubic yards of spillway and outlet-works concrete for Medicine Creek Dam.

- **Rubber for Roads**

  Test sections of rubber-asphalt pavement go down in Akron, U. S. rubber stronghold, and Columbus, Ohio. See page 30.

- **Concrete Modernizes Road**

  Workmen pave the center slab of a highway despite 15,500 vehicles whizzing by each day on both sides. See page 35.

- **Canals and Tunnel**

  Nor wind and weather, nor rock and rattlesnakes shall stop the Riverton Reclamation Project. Pages 40-41 testify.

- **Safety—Job Fires**

  Tend to precautions first of all—then to your fire extinguishers, says the article on page 46 of this issue.

- **Bituminous Jobs—Long Ones**

  A 54-mile road-mix job in Nevada, a record-breaker, turns up on page 52.

  A 28-mile hot-mix job in Tennessee breaks into print on page 77.

- **Mechanized Roadside Seeding**

  No laborious peg-and-twine mulching on this project—no sir. Not when machines can do the work. See page 70.

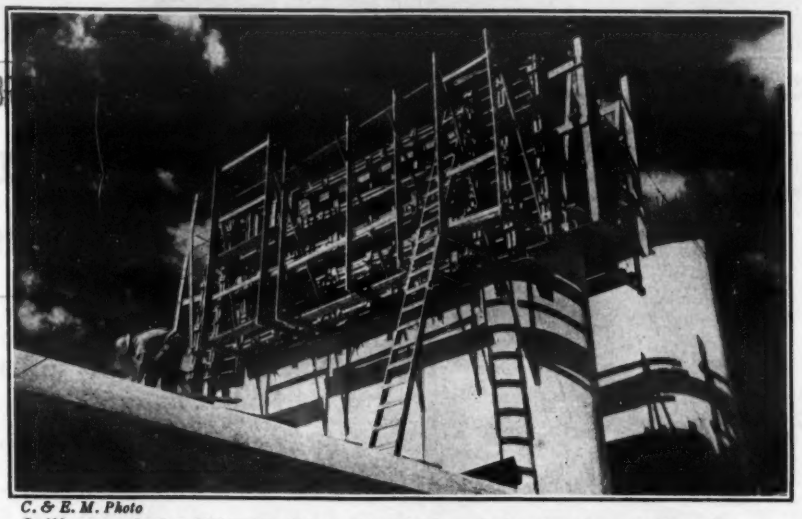
- **Radio on the Job**

  "Don't know how we ever got along without it," says the superintendent on a $5,115,000 dam job—see page 81.

- **Reclamation Hostilities**

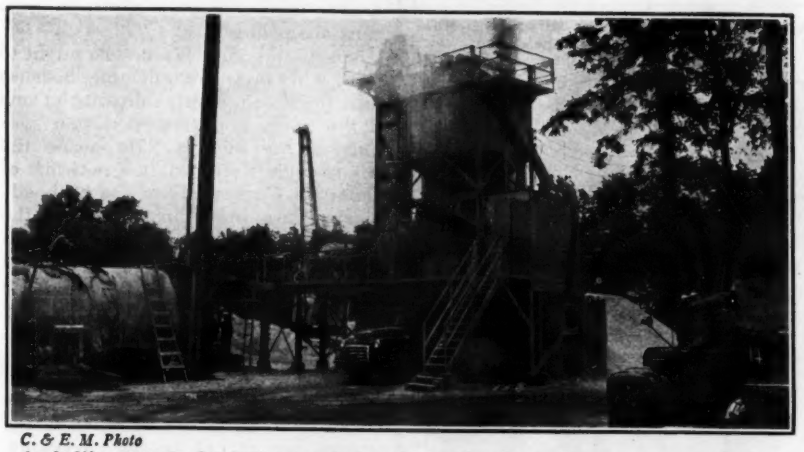
  Sparks flew as farmers, Congressmen, and top-brass reclamationists fought it out at the NRA meeting. Hold onto your hat and turn to page 85.

(You will find "In This Issue" on page 4)



C. & E. M. Photo

Outlined against a Nebraska sky, a concrete form is in place for a bridge pier pour on the spillway of Medicine Creek Dam. Page 23 features the Lytle & Amis contract.



C. & E. M. Photo

Asphaltic concrete for last season's longest paving job in Tennessee was mixed in this Hetherington & Berner 2-ton pugmill asphalt plant. See page 77.

C. & E. M. Photo

On a 17-acre site along the East River in New York City, the Secretariat Building for the United Nations is pictured in an early phase of construction. The article on page 5 covers the Fuller-Turner-Walsh-Slattery job.

"Service Plus" Drops Cost for Contractor

Equipment Distributor's "Service Plus" Policies Date Back to Years When He Too Was a Contractor

✦ THERE is a saying that when the west was settled, only the pioneers who were worth a damn went to Wyoming. The rest went somewhere else, where life was a little easier.

Never did a saying apply as well as this one does to Ray Studer. For Studer, President of Studer Tractor & Equipment Co. in Casper, was in every sense a pioneer when he came to the state. There were only two other equipment distributors in Wyoming at that time, and there were none in Casper.

That was not really so long ago: less than a decade, in fact. During the intervening years Studer has fought perhaps as tough a starting battle as any distributor of equipment in the country. While he is still not the biggest equipment distributor in the west, by far, many a customer, contractor, and state engineer will tell you that there is no better service anywhere.

One contractor's superintendent said, "Studer don't just sell a machine; he stays with you to keep it running."

Behind that statement is the basis of Studer's present policy, a policy which is not likely to change. For the name of Studer has long been associated with the contracting business. The President of Studer Tractor & Equipment Co. has an accurate idea of things he needed when he was a buyer and operator of equipment, and his service today is calculated to give Wyoming contractors what they want and need.

If a machine breaks down out on some remote mountain, Studer's men will stay until the machine is running again, whether that keeps them out over a week end or not. His place of business is staffed six days a week, and men are on 24-hour call over Sunday to give week-end service.

Only by keeping equipment running in top shape can contractors operate at a profit, and Studer shapes his business to meet that requirement. He covers Wyoming by automobile or plane; he keeps in intimate touch with all construction work going on in the state, giving the kind of personalized service men like. He has over 30 accounts now, and has spread a lot of equipment around since those first lean years.

A Real Success Story

This story properly begins in Minnesota, many years ago. E. A. Studer & Sons operated a successful contracting business there, and of 9 sons, Ray, Herb, Ed., Jr., and Ralph were the ones who had construction in their blood.

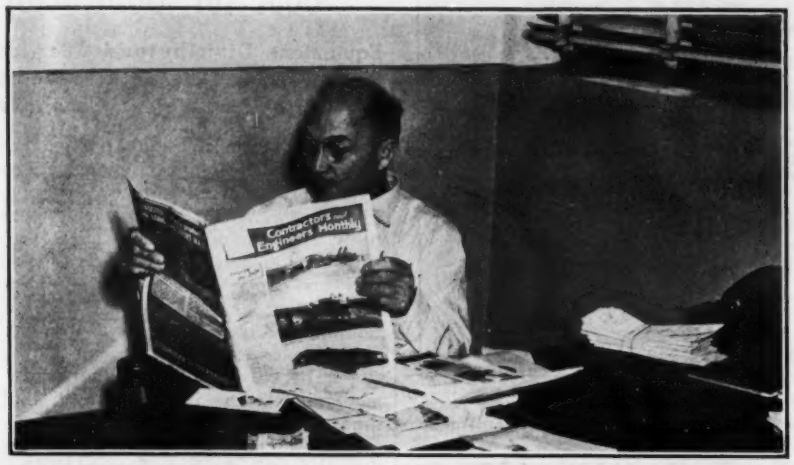
What might have been a continuing contracting business began to wane with the coming of the depression in the early 1930's. Business slacked off. Ralph and Herb went to Montana. They liked it there, and the other boys began

(Continued on page 88)

MAY 23 1951

From the air, the Kandiyohi County Highway Department at Willmar, Minn., with the new building for central administrative headquarters in the center

The modern concrete building was erected in 1940 with WPA and county funds. It has two main floors and a basement. Note, too, the radio transmitter tower.



In his large office on the main floor, Director Ward looks over his morning mail. He believes engineers should keep up to date by reading magazines in their field.

Before he goes out to the field, Maintenance Superintendent Erickson, in his main-floor office, goes over reports of the previous day's work.

Engineer and Roads Dropped by County

Read On to Find Out Why This Unusual County Had to Get Rid of "Highways" in Its Nomenclature

✦ THE way you look at a thing can make a lot of difference.

You can look at a transportation system for what it is, talk about it in a way that laymen and businessmen can understand, and it makes all the difference in the world when the appropriations are made.

So says Erwin S. Ward, who ought to know what he is promulgating, because he is the administrative director of one of the really good transportation systems in the midwest. He heads the county-wide transportation network of Kandiyohi County, Minn., and his headquarters are in Willmar. Not in the courthouse basement, either. His offices were planned to do a particular job, and they are out on the east edge of town in a new building designed for the purpose.

With the emphasis on central administrative control, activities in behalf of Kandiyohi County's transportation system include things like drafting, maintenance, equipment repair, surveying, laboratory work, cost accounting, and human relations. There are no engineers, although some of the administrative experts have graduate degrees in that profession. There are no "highways", because that is an outmoded term, and Kandiyohi County has thrown it in the discard in favor of the more factual "transportation system".

Despite this abrupt divorce between the new and old conceptions, automobiles and trucks suffer none at all when they have calls to make within the county. The system contains about 725 miles, which is all-weather-surfaced with gravel or asphalt, or both.

Sure, Ward has some of the usual maintenance headaches. His budgets are never quite enough, good men are hard to find, and they don't have enough hours in the days here, either. But those are details. Of greater importance in this county is the broad thought that a transportation system is nothing more or less than so much smooth-riding surface constructed for a certain amount of money.

An Unusual Survey

It was late August when CONTRACTORS AND ENGINEERS MONTHLY's western editor drove through the beautiful lake and agricultural country to Willmar, to meet this man who is attracting attention wherever county officials meet. It was the normal season for asphalt work, weed mowing, late-summer blade work to move the loose gravel over to the edge. That was all in progress. Men were quite busy at it. And they were happy to be busy, because Servis recorders on each of their machines were

(*Continued on next page*)

C. & E. M. and Kandiyohi County Highway Department Photos

In the equipment repair shop on the main floor, a Snogo gets a complete check-up.

In the welding shop, a welder works on a repair job.

writing in red ink accurate records of their performance.

But where was Ward?

Ward, with his daughter driving, was out in his Buick. They were cruising along slowly, apparently on a joy ride. But Ward was not really out of touch with things, because a long radio antenna stuck up from his car. Radio in a county? Sure, why not? . . . Ward had his back in 1942.

At any rate, Ward was busy with a survey.

Every mile of the Kandiyohi County transportation system was under surveillance. For Ward wanted to know the answers to some simple questions the public asks. How much has been invested? What's the reasonable life of this mileage? How much is maintenance costing? What about bridges? Have we got the proper right-of-way?

These are the questions farmers and businessmen, who also serve from time to time as county commissioners, always ask. Up until a few years ago, Ward had tried to answer them with the only thing at his command . . . technical terms of the profession. He had found that the commissioners and the people knew little and cared less about these terms. In other words, they refused to learn Ward's language in order to grant the appropriations he requested.

It was up to him to go to them, using their language.

So all of a sudden it wasn't a matter of whether the soil was A-7, or the bituminous surface MC-3 or RC-4, or whether the bridges would stand H-20 loading. Businesslike commissioners asked, "How many miles?"

Ward said, "Seven hundred and twenty-five."

"How much did that cost us?"

"Roughly $8,000 a mile."

"How long will it last?"

"I figure 30 years."

"Shouldn't we be building between 24 and 25 miles a year, then, to replace what's deteriorating?"

Ward smiled to himself. Give it to them straight, he thought, and they will catch on. He said, "Sure we should. We should do something else, too."

"Like what?" asked one of the commissioners.

"We should figure what it will cost us to build those replacement miles at today's prices, and what the maintenance cost will be."

"That sounds realistic," agreed the commissioner. "No use investing money unless you make maintenance give the most for the invested dollar."

That's what Kandiyohi County is doing: trying to boil this whole complex battle down to simple terms of dollars, of transportation miles, and comfort. The above conversation, or a reasonable facsimile, goes on at practically every meeting. It is paying big dividends, too, in a much better public understanding of the functions of Ward's department. This is resulting in more appropriations, and in an approach to the problem which is so sound and sensible that it will amaze Ward's many counterparts in other sections of the country not so fortunately staffed.

Administration the Foundation

When Ward came to the county in 1936, there was a big job ahead. It was apparent to everyone. The people were complaining, and the commissioners were in the frame of mind where they were saying, "We've got to build a transportation system fast, it must satisfy our people, and there must be no mistakes."

With all the authority he needed to go ahead with that difficult assignment, Ward—and the commissioners too—figured they would lay the job ahead on a solid foundation of administration, planning, cost keeping, the latest testing methods, and on common-sense business rules.

On a pay-as-you-go plan, Kandiyohi County started first not on the system, but on that foundation. It took courage to do that. A modern concrete building was put up in 1940, with the help of a WPA grant and county funds. It has two main floors and a basement.

This building was built on a full block of ground which the County purchased near the east end of Willmar. It is about 46 x 120. The upstairs floor contains a large drafting and design room with map cases, files, record-book storage, and all the paraphernalia the surveyors need to be able to go back 10 years and find any survey they ever made. The top floor also includes a shower room, a large conference room and library with a fireplace, a storage room for about 20 years' filing of records, and a large parts stockroom which is accessible from below.

On the main floor is the reception room, a large office where Ward makes his headquarters, a radio room, testing laboratory, garage, equipment repair shop, the maintenance superintendent's office with all stock cards and records, and a miscellaneous repair shop. A stairway leading from the maintenance superintendent's office goes up into the parts stockroom, where a plentiful supply of equipment repair parts is located.

The basement houses a battery and used-parts room and other miscellaneous storage spaces.

The building was finished and staffed, and a complete administrative set-up made, while the first construction and maintenance work was getting under

(*Continued on page* 92)

How Texas converts *two-lane* highways into *four-lane* superhighways

U. S. Highway 81 near San Antonio, Texas, widened from 20 to 52 feet and resurfaced with Texaco Asphaltic Concrete paving by the H. B. Zachry Company of San Antonio.

A total thickness of 4½ to 7 inches of durable, resilient Texaco Asphaltic Concrete was used in widening and resurfacing this section of U. S. 81.

U.S. 81 is one of Texas' principal north-south highways. It connects the city of Fort Worth with the Mexican border, where it meets the Pan American Highway. Greatly increased traffic made it necessary last year to more than double the width of a 4-mile section near San Antonio.

The method used by Texas in transforming this old two-lane highway into a four-lane superhighway will interest other road builders. A new sub-base was laid to a depth of 8 inches on each side of the old concrete pavement. Over this was constructed a plant-mixed Texaco Asphaltic Concrete foundation 6 inches thick. The old 20-foot pavement itself was covered with a 3½-inch leveling course of coarse-graded Texaco Asphaltic Concrete. Finally, a 1-inch wearing surface of fine-graded Texaco Asphaltic Concrete was laid over the full width of the new 52-foot pavement.

In modernizing this old, narrow highway, Texas takes full advantage of the resilient, durable, joint-free qualities of Texaco Asphaltic Concrete construction. Not only does this type of hot-mix asphalt paving stand up under the heaviest traffic impact for many years, but the cost of maintaining it is consistently low.

For complete information on Texaco Asphaltic Concrete construction, write our nearest office for the booklet, "Texaco Asphalt Paving—Plant-mixed Types."

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TEXACO ASPHALT

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Reclamation Is in Good Hands

If the 18th annual convention of the National Reclamation Association is an accurate illustration, western reclamation is in good hands. The jut-jawed fighting spirit of western "grass roots" farmers was never more apparent. Praise as well as criticism of Government agencies was heard. Clearly, a desirable system of checks and balances is operating in behalf of water development.

Nebraska's Governor Val Peterson drove home that point in a dynamic address on Missouri Basin development. Five separate opportunities in which private citizens might register opposition to contemplated works were told in detail by the Governor.

"The people must remain free to criticize reclamation policy, to question the design and location of dams, and to differ on other points," he said.

Close on the heels of the convention came the resignation of Secretary of Interior Julius Krug, prompted, say informed political observers, by sharp letters from President Truman which flayed the unauthorized jockeying through Congress of several Bureau of Reclamation projects. The same observers predict that the resignation of Reclamation Commissioner Michael W. Straus may soon follow.

The resignation of public servants, however, is not as important as the conduct of the affected agency, in a democratic way, in behalf of the nation. President Truman's action in vetoing several projects pointed up that fact.

Projects have come a long way in the century of conservation celebrated last year by the Bureau of Reclamation. The first simple one-purpose irrigation diversions, repayable by the water users, have grown in scope. Today's undertakings are complex multi-purpose affairs which affect the economic life of the entire nation. Their cost is shared in part by many people from all over the country.

It is vital to the national welfare that these daring projects, which speak so eloquently of brilliant engineering, be conceived for economic rather than political considerations. A project can usually be justified only on the basis of its economic value. A project created with political ends in mind had better remain unbuilt.

In Salt Lake City, convention speakers touched on these points. Dangerous trends were noted, and resolutions adopted to check them. Defective policies were exposed; studied; remedied. Happily, these formed but a small part in the general reclamation construction program. The significant fact is that the flaws were exposed and appropriate steps were taken to correct them.

"If the head of this organization is to be one who dare not express his honest convictions when they happen to run counter to those of Government brass hats—or must hold his silence in coming to the defense of that kind of government under which this country owes its existence; or if he must fly to the support of every proposal for its name's sake alone—then I feel here is one President who is entirely misplaced!" thundered Harry E. Polk, President of NRA.

With $354,000,000 appropriated for reclamation this fiscal year—an all-time record; with several questionable projects vetoed; and considering the kind of language in the preceding paragraph, it would appear that western reclamation is in good hands and the west is on the way toward the fulfilment of its destiny.

1950—Opportunity Ahead for AED

This month the Associated Equipment Distributors meet in Chicago. At no time in the history of the AED has it approached a coming business year with greater concern. This is a healthy condition, for only by evaluating present-day problems can the distributor be fully aware of his opportunities.

While many AED members doubtless realize this, there will nevertheless be talk of business recession, sales resistance, and construction curtailment. Much of the meeting may be devoted to the solutions of these problems.

But the simple fact is, construction has grown up. In a world of ever-increasing population, that fact stands out so fundamentally that often it is overlooked. There is only one way that construction volume can move. Up.

In 1950, highway construction is expected to be a billion-dollar-a-year business. Reclamation will reach almost half that figure. Building, industrial construction, development of waterways, flood control, pipe lines—all the various construction enterprises which bring better living to more people—will reach a new peak. To the individual equipment distributor, this means real opportunity for service and profit.

It is such a simple truth that it should not be overlooked.

Public Relations—what are they? Here's one definition by J. C. Seidel in the "Public Relations Handbook". "Public relations is the continuing process by which management endeavors to obtain the goodwill and understanding of its customers, its employees, and the public at large—inwardly through self-analysis and correction; outwardly, by all means of expression." Contractors, highway officials, dealers, and manufacturers: think it over.

Construction Equipment Can Overload Roads Too

To the Editors,

CONTRACTORS AND ENGINEERS MONTHLY:

In your November issue [page 1] there is a well written article covering the AASHO meeting at San Antonio, in which a considerable space is devoted to the highway overload problem.

On page 83 reference is made to some of the information I had submitted to the convention, but unfortunately it contains an erroneous figure, which if observed by the readers will lead them to believe that Minnesota is extremely conservative in its viewpoint concerning loads on highways. I make reference to the following statement: "As an example he mentioned some new earth-moving scrapers weighing 17½ tons even when empty."

The figure 17½ tons was the weight on a single axle, and not the total weight of the equipment, since many of these earth-moving units weigh much more than 17½ tons (in total) when empty. It is estimated that some of these units may weigh up to 60 tons when fully loaded, and the load is usually transported on two axles, or four wheels.

It would, therefore, appear that if highways are presumably being designed and built to carry safely axle loads not to exceed 9 tons (wheel loads 4½ tons) there may be some question about the advisability of employing equipment in the construction of highways that imposes loads that are three times as great.

During the past several years I have, during my vacations, traveled over highways in practically every state in the Union, and as far as I could see, all states to a greater or lesser degree are confronted with the same problem of having some of their roads seriously damaged, and even destroyed, by overload use.

I have furthermore become suspicious of the possibility that many highways, or at least portions of them, have during the course of their construction become over-strained and possibly seriously damaged, even before they are opened to traffic, because of the use of construction equipment of excessive weight.

Yours Very Truly,
C. L. Motl, Maintenance Engineer
Minnesota Department of Highways
St. Paul, Minn.

The Moles Awards

Former President Herbert Hoover and Richard E. Dougherty, retired Vice President of the New York Central System in charge of improvements and development, will receive the tenth annual Moles awards for their outstanding contribution to construction and their achievements as citizens. The award winners were announced at The Moles' annual fall membership dinner by Carlton S. Proctor, President of the association. The presentation will be made at an award dinner on February 9 at the Waldorf-Astoria Hotel in New York City.

The Moles, an association of heavy-construction men, formally honors one member and one non-member each year. Mr. Hoover, a non-member, was selected for the award in recognition of his long career in public service, for his Chairmanship of the Commission on Organization of the Executive Branch of the Government, and for his achievements as a mining engineer. In announcing Mr. Dougherty's selection for the award, Mr. Proctor mentioned his contributions to city and port planning and to railroad and civil engineering; he cited particularly his efforts to improve public transportation by the removal of grade crossings, and the modernizing of terminal and station facilities. He also lauded Mr. Dougherty's activities as a civic leader in New York and White Plains.

Accident-Prevention Dinner

The Constructors Association of Western Pennsylvania recently held its semi-annual Accident Prevention Dinner at the Fort Pitt Hotel, Pittsburgh, Pa. These dinners are given by the Association in order to stress the responsibility of supervisory personnel in accident-prevention programs. A talk by Captain Joseph Fay of the Pittsburgh Fire Department gave the more than 225 supervisors and foremen present new information on fire-prevention techniques and first-aid practices for injuries received in fires and explosions. Practical demonstrations accompanied the talks.

A Jingle Contest concluded the evening. William Allardice of John F. Casey Co., Burke Moore of Eichleay Corp., and Archie McCollum of Booth & Flinn Co., were first, second, and third-prize winners respectively among more than 100 contestants.

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At an award dinner on February 9, The Moles will honor former President Herbert Hoover and Richard E. Dougherty, retired Vice President of the New York Central System, for their contributions to construction and their achievements as citizens.

Progress Is Steady At U. N. Capital Site

Skyscraper Secretariat's 39 Stories Are Founded on Rock; Completion of the Building Is Expected by 1951

By WILLIAM H. QUIRK,
Eastern Editor

(*Photo on page* 1)

✦ AT the 17-acre midtown site on the Manhattan side of New York City's East River, the United Nations' permanent world capital is fast taking shape. The steel framework for the 39-story Secretariat building was finished by September, 1949, and dedication ceremonies, attended by President Truman, took place on October 24. Before 1951 rolls around, this first of three major structures to be erected is scheduled for completion. The other two large units —the conference area and the General Assembly Building—are to be constructed, officials hope, in time for the September 1951 meeting of the Assembly in the new world capital. Congress has approved a $65,000,000 interest-free loan for the construction of the U. N. headquarters.

The site covers six city blocks from First Avenue to the East River and the bordering drive, and from 42nd Street north to 48th Street. In the early history of New York City the shore line of this area formed a small rock-bound cove called Turtle Bay, into which emptied a creek that drained the southerly end of Central Park. Later the cove was filled in behind a rock-filled timber crib, to add a few more valuable acres to the narrow confines of Manhattan Island. When this site for a world center was acquired in the spring of 1947, it was occupied primarily by broken-down tenement houses, a brewery, and slaughterhouses.

At the south end of the tract, the 39-story Secretariat is being erected. Just to the east and north of it, and the next to be undertaken in the construction program, is the conference area which contains meeting halls, Council chambers, and conference rooms. North of the Secretariat, the fan-shaped General Assembly Building will be constructed, thus rounding out the first three-unit building program. All three units are to be interconnected.

In the ultimate plan for the site, a 30-story office building will be constructed at the north end to accommodate delegations, their staffs, and specialized agencies. An underground garage for 1,500 cars will also be built beneath the site. At present the former Housing Authority Building, near the corner of First Avenue and 42nd Street on the site, is being used by the U. N. construction planning staff. Eventually, however, this will become the U. N. library.

Site Excavation

Demolition of the 50-odd buildings on the site got under way in July, 1947. Done in piecemeal fashion, the work was slow and took over a year. Ground was broken on the excavation for the first three buildings on September 14, 1948, after a contract for excavation only had been awarded to the Slattery Contracting Co. of Woodside, N. Y. This first contract included the removal of the old brick and concrete foundations of the buildings formerly occupying the site, as well as general site excavation. Dynamite was used on these old foundations, and in bringing the rock to grade. The rock at the U. N. site, which formed the steep banks of Turtle Bay, is of Manhattan schist, a coarse quartz-mica stratum.

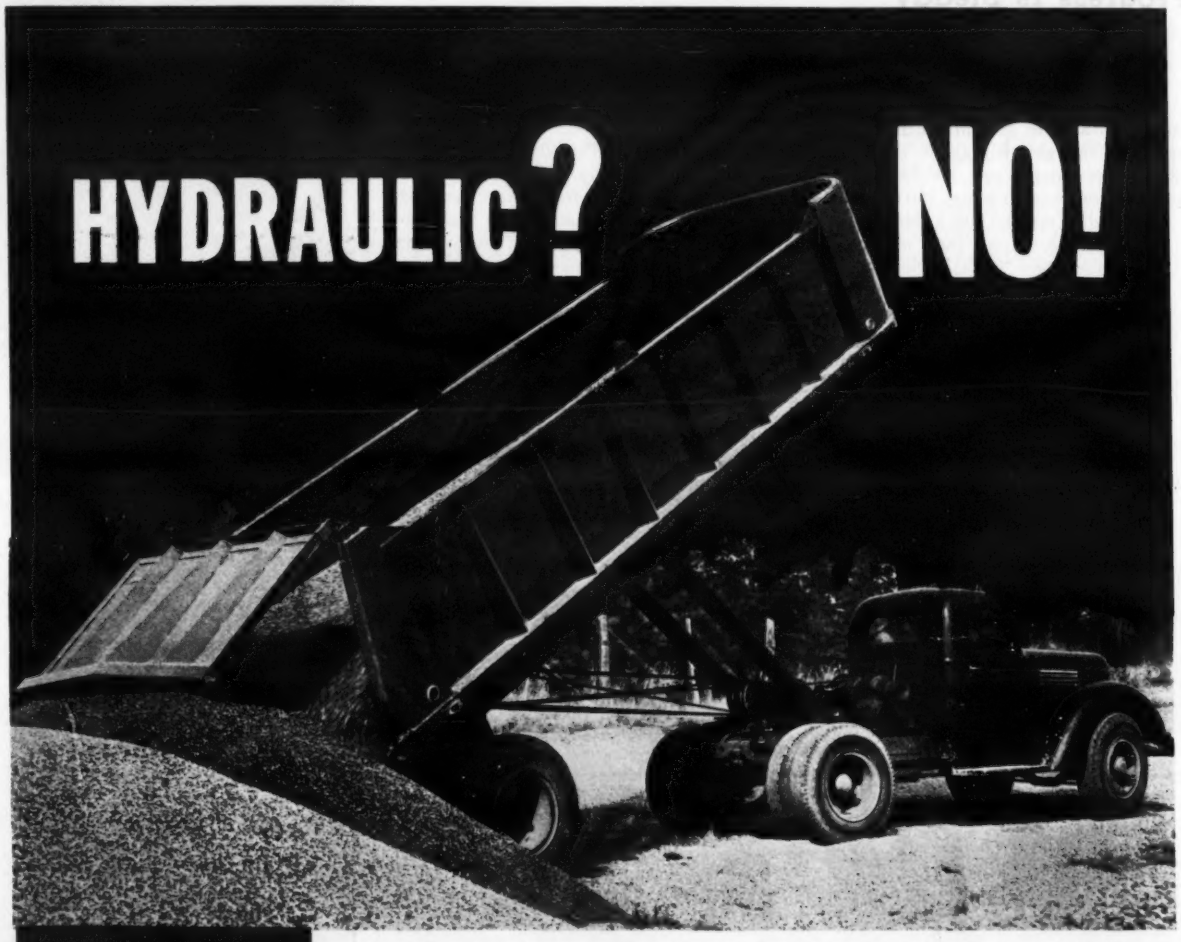
The contractor employed 3 shovels, a crane with clamshell bucket, and a fleet of 40 dump trucks to remove the material. The depth of excavation varied greatly over the site. Along First Avenue the ground was nearly 40 feet above the level of the East River, while along the east side of the tract the elevation averaged around 10 feet above the level of the water. The design called for the top of foundations to be 4 feet 2 inches above the mean-high-water mark of the river. Thus the depth of cut varied between 6 and 36 feet.

The best of the excavation was stockpiled on the site for use later as backfill. The less desirable material was hauled either to LaGuardia Airport in Queens or to Randalls Island in the East River for placing in land fills.

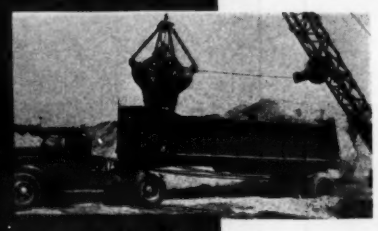
(*Continued on next page*)

C. & E. M. Photo

Fuller-Turner-Walsh-Slattery, Inc., holds the major construction contract for the United Nations Headquarters in Manhattan. This was taken during foundation work.



No other unit can hope to match the *cable-operated* Clement Dump Trailer in unloading on rough terrain, spread dumping, spot dumping, or angle dumping. The CLEMENT TRAILER is the only unit that can successfully dump when the rear wheels of the trailer are at a severe angle of as much as 25°.



TO DISTRIBUTORS:

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WINCH-LIFT, INCORPORATED SHREVEPORT, LOUISIANA

C. & E. M. Photo
On a muddy day last spring, a world capital in the making — United Nations headquarters along New York City's East River, Fuller-Turner-Walsh-Slattery, Inc., contractor.

C. & E. M. Photo
In one part of the project, men were excavating for concrete footings to support the Secretariat Building, using I-R drills.

Progress Is Steady At U. N. Capital Site

(Continued from preceding page)

Unsuitable material was loaded into barges, towed to sea, and dumped. In bringing the general grade down to 4 feet above mean sea level, the contractor removed about 150,000 cubic yards of dirt and 65,000 cubic yards of rock. All through the excavation, sewage facilities in that area were maintained, and pipes crossing the site had their supports strengthened against blasting. A subway ventilating shaft that crossed the lot was also protected and underpinned to rock during this phase of the work.

Contract for Secretariat Building

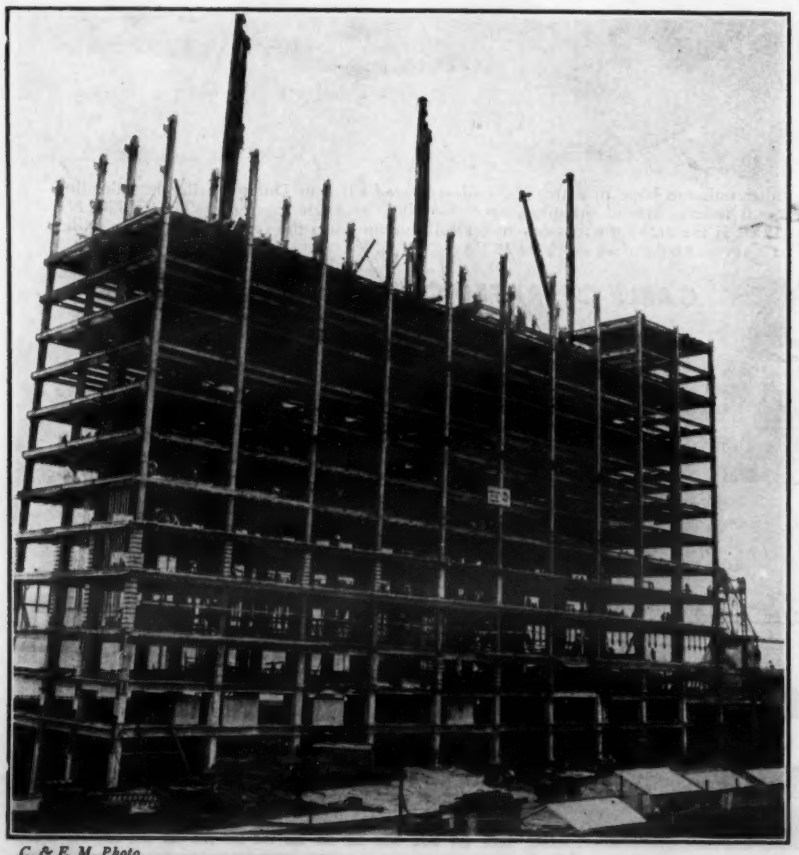
In January, 1949, the United Nations awarded a $23,809,573 contract for the construction of the Secretariat Building. The contract also included the foundations of the General Assembly Building, and the meeting-hall area containing the Council chambers and conference room. The conference building will be a four-story structure containing 18 rooms; the Assembly Hall will have a public seating capacity of about 1,000. This major construction contract went to Fuller-Turner-Walsh-Slattery, Inc., a corporation comprising four leading firms; the George A. Fuller Co.; Turner Construction Co.; the Walsh Construction Co.; and Slattery Contracting Co., Inc.—all of New York City.

The Secretariat Building is a tall, thin structure measuring 287 feet long from north to south, 72 feet wide, and 544 feet high. Its 39 stories, not including three basements below ground level, will tower above the long, low assembly building. The narrow north-south ends, faced with 2,000 tons of Vermont marble, will be without windows. The broad east-west sides, however, will be practically all windows, with 2,700 aluminum-framed windows on each side. The spaces between the windows will be surfaced with blocks of black-colored glass. The blue-green glass to be installed in the 5,400 windows is designed to absorb the heat and reduce solar radiation. Thus the sunlight will have little or no effect on the temperature of these all-"outside" rooms.

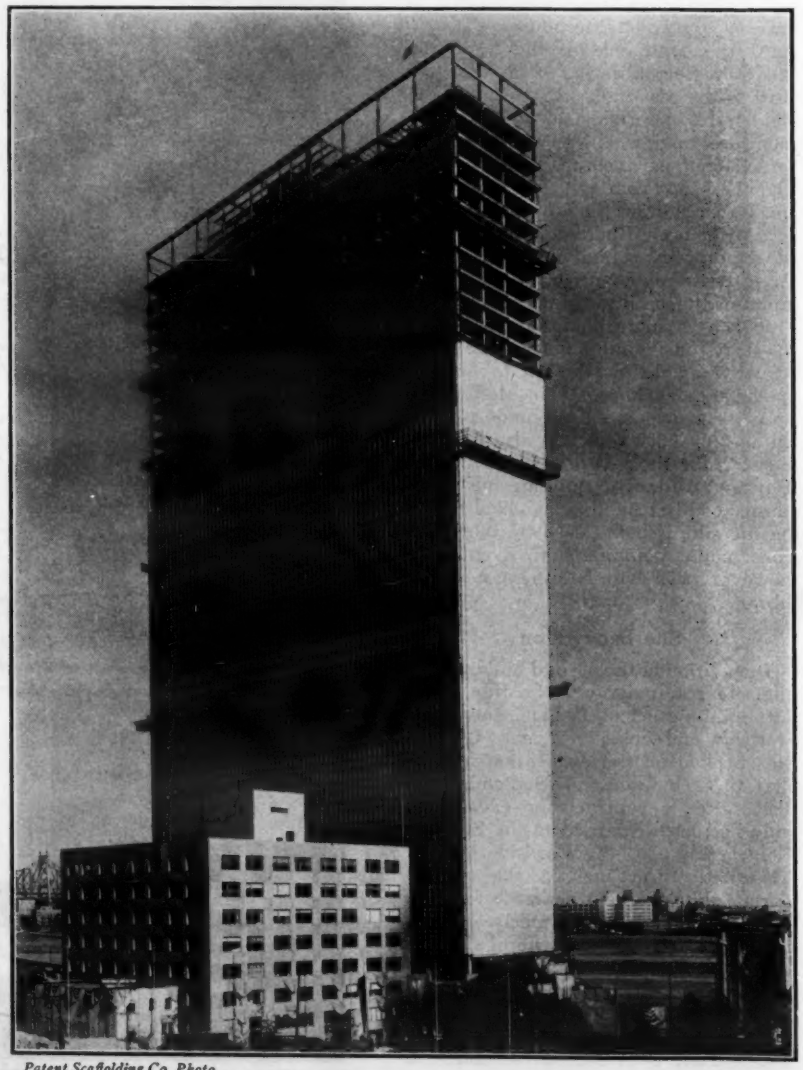
The temperature within the individual rooms can be controlled by the occupants, since the Carrier air-conditioning system will be composed of 4,000 separate units. The Secretariat

(Continued on next page)

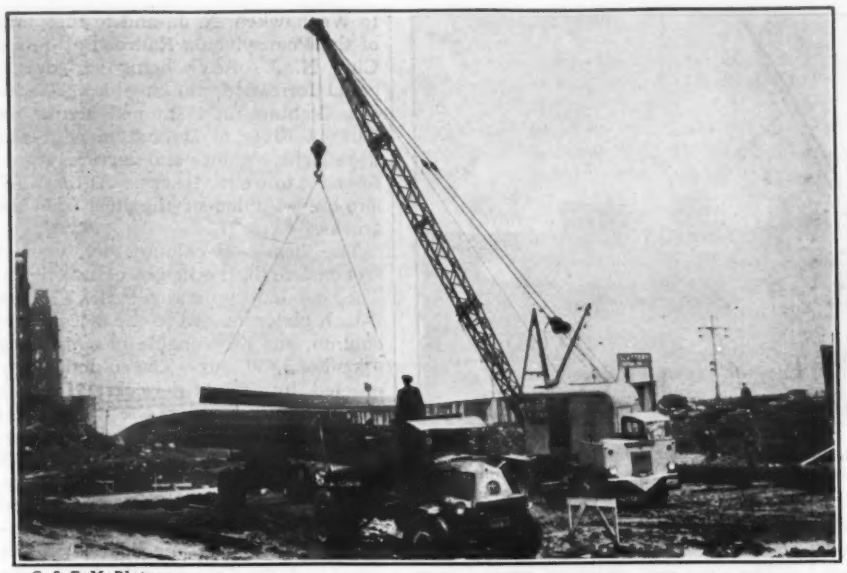
C. & E. M. Photo
In another footing, a carpenter prepared forms for an 8-inch column-base wall to pocket steel grillage. Wing plates will distribute the load from column to grillage.



C. & E. M. Photo
Three months later, steel erection was coming right along on the 39-story structure, and by October 24, dedication ceremonies attended by President Truman took place.



Patent Scaffolding Co. Photo
This view taken on dedication day shows the steel work topped out, with Gold Medal safety scaffolding for glaziers and stone cutters still in place.



C. & E. M. Photo
Steel H-piles came to the U. N. site in this Mack-powered pole trailer and were unloaded by this Lorain Moto-Crane. From there they were snaked wherever they were needed.

C. & E. M. Photo
Concrete for building floors was discharged to a hopper at the bottom of the tower hoist from this Jaeger 7-yard truck-mixer mounted on a Mack truck.

will contain 889,000 square feet of office space, restaurants, departmental conference rooms, and corridors. Official records and mail will be speedily handled by means of electric conveyors and pneumatic tubes. In addition to eight glass-enclosed bronze escalators on the lower floors, 21 high-speed elevators will service the building. Underground coils will carry a warm liquid to melt snow and ice on the miles of walks and roadways.

Foundation

The general excavation at the site was completed in February, 1949, a month ahead of schedule. By that time pouring of the mass-concrete foundations had already been started. The Secretariat Building rests partly on bedrock and partly on concrete piers. These vary in thickness according to the weight and height of the part of the structure being supported. Most of them are 10-foot square sections of concrete down to rock at an average depth of 13 feet below sea level.

The Secretariat is located, however, where the bedrock is not too far below the surface of the ground. Elsewhere, principally in the filled-in area formerly Turtle Bay, the depth to bedrock varies from 20 to 90 feet. Here, steel piling driven to rock will support the foundations of the General Assembly and the meeting-hall area, since concrete piers are economical only to a depth of about 20 feet.

The excavation for the concrete pier footings went down through the Manhattan schist to the more solid granite stratum beneath. The depth into the firm-bearing rock averaged from 4 to 6 feet. Altogether, 44 separate footings were required for the tall building, laid out in four rows along the north-south axis. A few wagon drills, but mostly jackhammers, were employed for the drilling—both for blast and line holes. The blast holes averaged about 4½-foot centers, while the line holes around the perimeter of the excavations were drilled on 6 to 12-inch centers.

Compressed air for the drilling was furnished by a battery of seven compressors—four Worthingtons, one In-

(Continued on next page)

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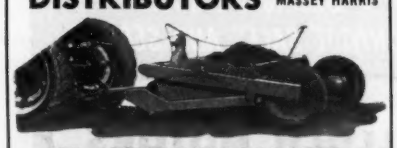

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20,000 HR. TRAXCAVATOR "Buys" Mate ...Boom Road System Improvement Program

● Jordan Township, Whiteside County, Illinois, put the TRAXCAVATOR at the left to work, in April, 1939. Within 7 years, this machine had loaded over 102,000 cubic yards of gravel. So many other tax-saving, community-aiding jobs were found, it couldn't keep up with needs for its services!

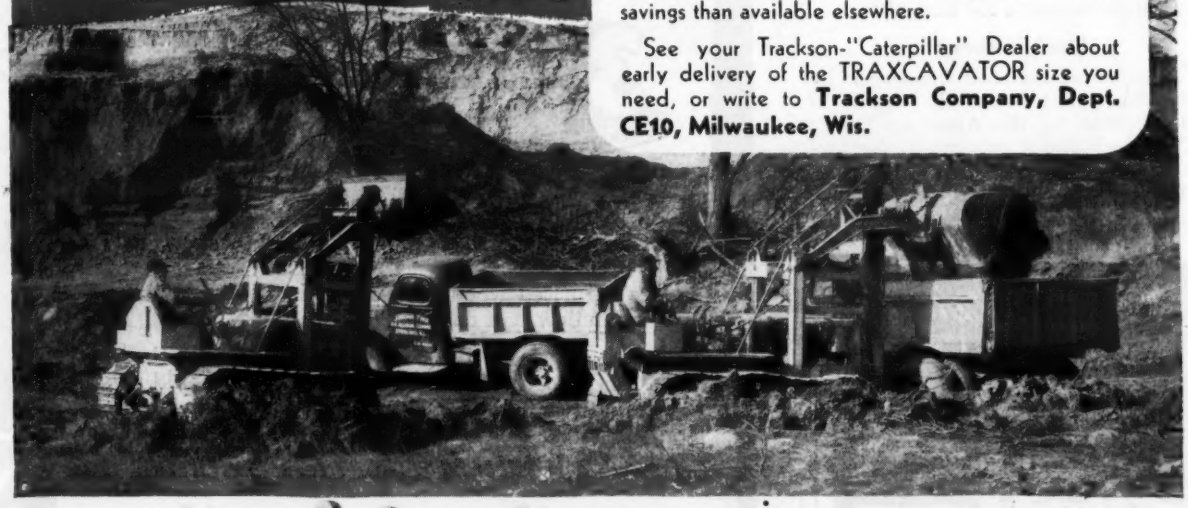
A Diesel mate was bought for this veteran by the township with savings earned. By now, the first unit has operated over 20,000 hours. And the pair keeps on gratifying taxpayers!

They dig and load up to 32,000 (total) yards of road gravel annually. They do special ditch work; excavate for culverts; clear snow; pull hedge; change stream courses; load "borrow" dirt for special purposes; are winter-ready to load skid-proofing materials after sleet storms.

"What gratifies us especially is the variety of work beyond its regular duties this machine has been able to do. Our records show that the average repair expense on our first machine has been less than 15c per hour," states Jordan Township Commissioner R. E. Allison, Sterling, Illinois.

Trackson builds TRAXCAVATORS to turn the traction-harnessed horsepower of "Caterpillar" Diesel Tractors into big yardage production. To match tractor strength and year-resistance, and to provide movers of materials, from shot-rock to city rubbish, with more savings than available elsewhere.

See your Trackson-"Caterpillar" Dealer about early delivery of the TRAXCAVATOR size you need, or write to **Trackson Company, Dept. CE10, Milwaukee, Wis.**



Here is the Model T4, today's version of Jordan Township's 20,000-hour TRAXCAVATOR. 4 TRAXCAVATOR Models, to team with D2, D4, D6 and D7 Tractors.

Jordan Township's TRAXCAVATOR team is shown loading earth in Township trucks for special fill purposes. Gravel loading is their main job!

TRAXCAVATOR
REG. U. S. PAT. OFF.
The Original Tractor Excavator

Progress Is Steady At U. N. Capital Site

(Continued from preceding page)

gersoll-Rand, one Gardner-Denver, and one Chicago-Pneumatic. They fed a receiving tank from which air was piped over the whole job. During the drilling operations several Kadco dust-control units were spotted about the site, their hose connections dropping down into the holes where the men were at work so as to draw off the fine stone dust.

The blast holes were charged with Du Pont 40 per cent dynamite, the maximum strength permitted within the limits of New York City. The charges were small, and heavy, woven, steel-wire mats were placed over the holes to contain any flying rock. Shovels or cranes with muck buckets loaded the rock rubble into waiting trucks. Water seepage from the river into this filled-in area was considerable, and several Marlow 6-inch pumps were busy keeping the footing excavations unwatered.

Footings

As the footings were excavated, they were sheeted when needed with 3 x 10's driven by an air hammer. The maximum depth of sheeted hole was 16 feet; below that the rock was sufficiently firm to do without any support. The sheeting was braced on the inside with 3 x 3 wales. The footings were poured with 3,000-psi transit-mix concrete, no forms being used below the sheeting since the rocky sides of the hole served for that purpose. Above the bottom of the sheeting, wooden forms were used for the concrete piers. Around the top of the concrete footing an 8-inch wall was poured within plywood forms. This formed a concrete pocket for the steel grillage.

The concrete foundation footing is topped by 1-inch-thick cement waterproofing on which rests the grillage steel. Thus the grillages are encased in concrete which is protected by a complete envelope of waterproofing to guard the grillage from corrosion. The load from the building columns to the grillage I-beams is distributed by wing plates which are riveted to the base of the column. Billet plates, 4 to 5 inches thick, are welded to the I-beam grillage, and then riveted to the wing plates.

Steel Framework

Erection of the steel framework for the Secretariat began the middle of April, 1949, by the American Bridge Co., which had a subcontract for furnishing and erecting the 13,000 tons of structural steel required for the building. Because of the narrow width of the building, some of the largest wind-bracing connections ever developed were used to strengthen the steel framework. These connections are much heavier than for the average 39-story skyscraper. As the steel went up, the pouring of the concrete floor slabs followed closely behind.

C. & E. M. Photo

A bank of Worthington, Ingersoll-Rand, and Gardner-Denver compressors supplied air for drilling during footing excavation at the United Nations headquarters site.

The steel was delivered by rail from the American Bridge Co. plant at Ambridge, Pa., a suburb of Pittsburgh, to Weehawken, N. J., and to the yards of the Pennsylvania Railroad at Jersey City, N. J. After being sorted into panel formation, the steel was loaded onto lighters, and shipped across the Hudson River to Manhattan west-side docks where cranes and derricks transferred it to trailer trucks. At the U. N. site cranes unloaded the steel from the trucks.

The heavy H-columns average 24 feet in length, the height of two floors. They are built up with a series of 1 and 2-inch plates riveted to the faces of the column, and are capable of supporting a load of 3,650 tons. The columns were erected by stiffleg derricks. The big steel framework for the Secretariat was completed by this past September.

Three 50-ton stiffleg derricks, with 85-foot masts and 75-foot booms, erected the steel. They were powered by two-drum diesel-driven hoist engines. Working at one floor level, the derricks erected steel for the two stories above that, and then made a two-floor

(Concluded on next page)

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Incredible! You'll say so yourself when you first lift a McCulloch 3-25 *one-man* chain saw. You'll be even more surprised when you saw with it. How that little yellow fellow can cut!

Light and Fast Cutting Judging by the way the McCulloch 3-25 cuts, you'd think it should weigh 40 to 50 lbs. The fact that it doesn't—that it weighs only 25 lbs.—is a tribute to McCulloch engineering.

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20" Model 5-49 . . . $385
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60" Model 5-49 . . . $425

20" 5-49 Bow Saw . . . $425

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15" 3-25 Bow Saw . . . $325

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3-25 HAS EVERY FEATURE

★ 3 hp. ★ 25 lbs. weight, complete with 18" blade and chain ★ Automatic clutch ★ Built-in chain oiler ★ Full-power sawing at any angle ★ Kickproof rewind starter ★ Easily accessible ignition points ★ One-hand controls

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C. & E. M. Photo
A Kadco dust-control unit drew off fine stone dust during foundation drilling for the U. N. Secretariat Building.

jump. All told, twenty jumps were required to complete the entire framework. Beams connecting to columns are riveted, while the intermediate beams are bolted in place. As many as sixteen riveting crews were employed on the erection.

All columns and beams are encased within a 2-inch covering of concrete as a fireproofing measure. This encasement is poured at the same time as the floor slabs, which are from 4½ to 6 inches in thickness, depending on the load to which they will be subjected. Wooden forms are used in the floor-slab construction, the arch-beam members being supported by the steel. Transit-mix concrete is furnished by the Colonial Sand & Stone Co., Inc., from its near-by plant at 63rd Street and East River Drive.

Gritcrete, a lightweight concrete, is used for the floor-slab pours. The aluminum dust or powder that produces the air bubbles to lighten the concrete is added to the transit-mix trucks when they reach the site. Another short mixing period, and the concrete is discharged into a 5-yard receiving hopper below ground level at the east side of the building. From here the concrete is chuted through a gate into a 1-yard bucket carried on a platform hoist. Then it is raised to the floor being poured. Two hoists are set up at the east side of the Secretariat, one for concrete and the other for materials. Both are operated by Lidgerwood electric-driven two-drum hoists.

Quantities and Personnel

A few building quantities illustrate the size of the U. N. job which is second only to Rockefeller Center as the largest building project in New York City. The world-capital headquarters will require 26,000 cubic yards of concrete for foundations; 6,000 tons of reinforcing steel; 4,000,000 bricks; 7½ acres of roofing; 8 acres of glass; 16 acres of acoustical ceiling; and 4½ miles of office partitions. The air-conditioning system will require 50 miles of pipe, 150,000 tons daily of chilled water, and 550 miles of electrical wire. Besides the 13,000 tons of structural steel in the Secretariat Building, from 10,000 to 11,000 tons will be needed for the conference-hall area and for the covering over the East River Drive.

The newly formed combine of Fuller-Turner-Walsh-Slattery, Inc., is headed by Lou Crandall, President, who is also President of the George A. Fuller Co. Its Vice President is William A. Durkin, President of the Walsh Construction Co. James Slattery and H. C. Turner, Jr., are Secretary and Treasurer respectively; they are also Presidents of the companies bearing their names.

Findlay Manager Retires

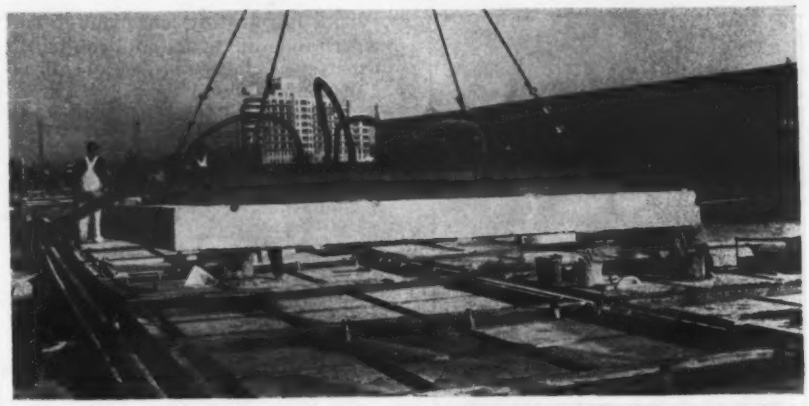
Joseph W. Hennen has resigned as Manager of the Findlay Division of Gar Wood Industries, Inc., at Findlay, Ohio. He expects to engage in the manufacture of construction machinery.

Plastic-Faced Plywood

A 4-page fully illustrated folder on GPX all-purpose plastic-faced plywood is available from the Georgia-Pacific Plywood & Lumber Co., Empire State Building, New York 1, N. Y. The bulletin explains that GPX is high-grade exterior Douglas-fir plywood bonded with waterproof phenolic adhesive, and surfaced with phenolic plastic overlay, a modern building material applicable for a variety of uses. Its smooth, glossy surface is said to be practically impervious to moisture and highly abrasion-resistant; it minimizes checking and grain raise.

The catalog points to extensive use of this plywood for concrete forms and to features that make it adaptable for this particular work: its hard surface and easy fabrication. The folder lists the specifications for GPX plywood, its applications, and its features.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 45.



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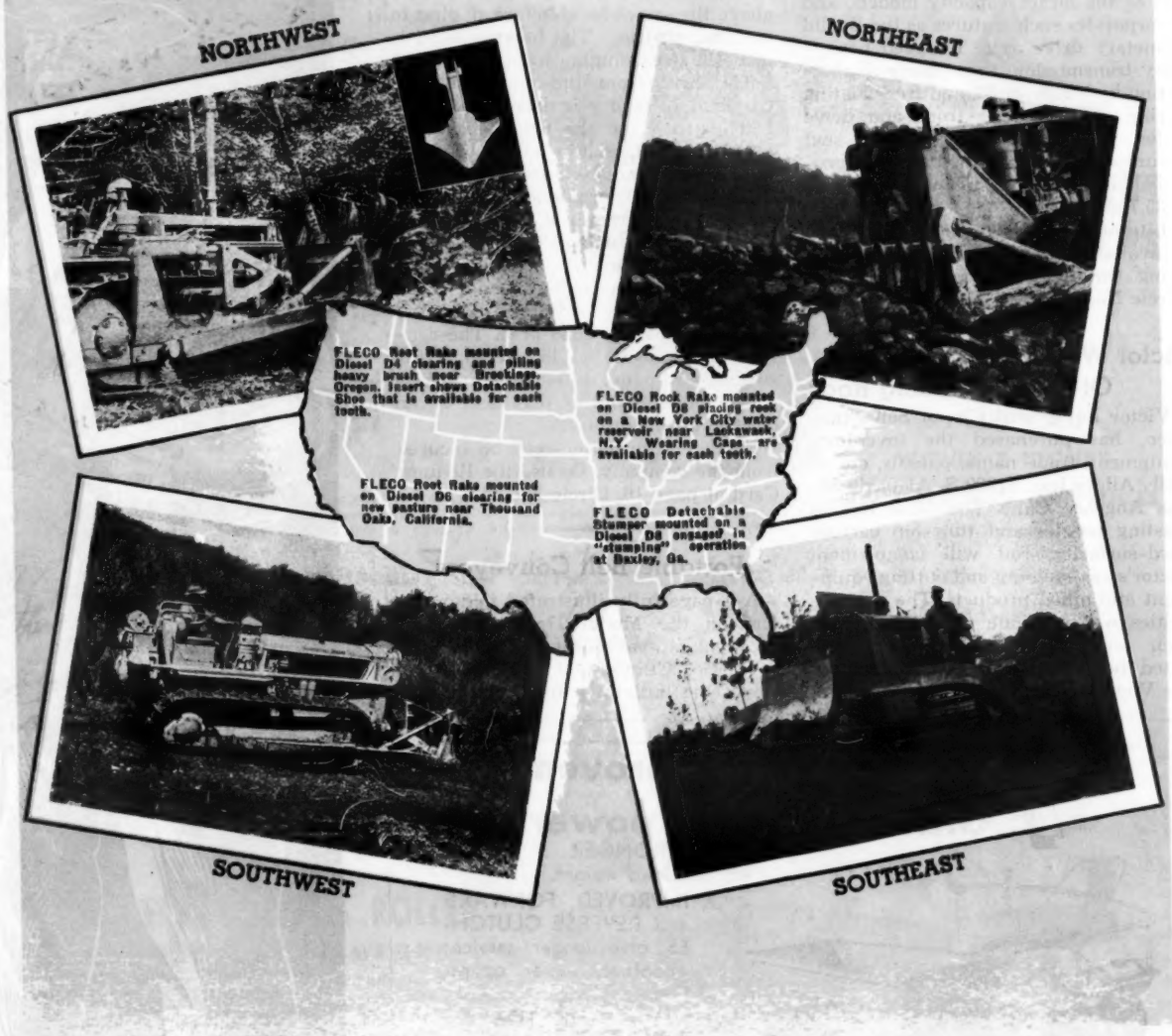
NORTHWEST
NORTHEAST
FLECO Root Rake mounted on Diesel D4 clearing and piling heavy brush near Brookings, Oregon. Insert shows Detachable Shoe that is available for each tooth.
FLECO Rock Rake mounted on Diesel D8 placing rock on a New York City water reservoir near Lackawack, N.Y. Wearing Caps are available for each tooth.
FLECO Root Rake mounted on Diesel D6 clearing for new pasture near Thousand Oaks, California.
FLECO Detachable Stumper mounted on a Diesel D8 engaged in "stumping" operation at Baxley, Ga.
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This is the equipment that is doing more jobs better, at lower cost. Not limited to any one section of the country—or the world—FLECO Products are used for stumping, clearing, piling, boulder removal, rock and root raking, soil conservation programs and many other daily new uses. Rakes are manufactured to fit any type dozer with detachable moldboard. Detachable Stumper is mounted on a standard angle-dozer "C" frame. All products are interchangeable with your standard dozer equipment which give you quick change-over for more productive hours at less cost. Write today for folder or contact your nearest FLECO "Caterpillar" distributor or dealer, located all over the world.

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1561 West Church Street Jacksonville 3, Florida P. O. Box 2317

Latest of the Euclid line of earth-movers—the 10-ton Model UD rear dump.

New 10-Ton Rear-Dump Unit for Heavy Hauling

The latest addition to the line of earth-moving equipment made by the Euclid Road Machinery Co., Cleveland 17, Ohio, is the Model UD rear-dump Euclid. This model has a payload capacity of 10 tons; struck measure is 6.6 cubic yards. Other Euclid bottom-dump and rear-dump models range in capacity from 15 to 40 tons.

Powered by a 125-hp diesel engine, the Model UD is designed for heavy off-the-highway hauling in construction, quarry, and industrial work where a unit of a 10-ton capacity meets job requirements. It is built to the same rigid standards of construction throughout as the larger-capacity models, and incorporates such features as the Euclid planetary drive axle, 10-speed heavy-duty transmission, three-stage double-acting hydraulic hoist, and free-floating spring mounting for front and drive axles. A form-fitting driver's seat mounted on shock absorbers is provided. Top speed with capacity payload is 35.7 mph.

Literature and complete information is available from the company, or by using the Request Card at page 16. Circle No. 33.

Victor Will Make Line Of Hard-Surfacing Rods

Victor Equipment Co., of San Francisco, has purchased the inventory, equipment, trade name, patents, etc. of Mills Alloys Inc., 11320 S. Alameda St., Los Angeles, Calif. The Mills line of blasting nozzles and tungsten carbide hard-surfacing rod will complement Victor's gas-welding and cutting equipment and allied products. The new facilities will continue to be located at their present site and will be designated the Alloy Rod & Metal Division of the Victor company.

Victor has already laid plans to add modern rod-rolling and mill equipment to the seven electric furnaces acquired by the purchase, with a view to producing a complete line of hard-surfacing welding rods. This new product will be sold in the company's retail sales territory and through dealerships which will be established.

New Surface Heater For Asphalt Paving

A new model of the Clarkmoore asphalt-surface heater, designed for resurfacing of sheet asphalt, rock asphalt, asphalt block, and plant-mix, has recently been announced by the Asphalt Maintenance Co., 41 Park Row, New York 7, N. Y. This heater unit is mounted on a 2½-ton Diamond T truck chassis, with all controls located in such a manner that the operator can operate and move the machine forward without having to enter the cab of the truck. It has an overall length of 28 feet, a width of 7 feet 5 inches, and a height of 7 feet 6 inches.

All operating parts are completely enclosed in the machine frame with easily operated by-passing doors on both sides. A single heavy-duty 6-inch hydraulic hoist, completely enclosed in the machine, is used to raise and lower the heating hood. The hood can be raised and lowered by the operator while standing in the street or on the running board of the truck. It can be raised in a vertical plane 10 inches above the street level before tipping to carrying position. The heating hood is made in sizes ranging from 5 to 8 feet.

The heat from the burner of the Clarkmoore heater is deflected, by the hood surface, to the pavement. This burner throws a flat or horizontal flame into the hood area, eliminating a "blow torch" effect. Approximately 10 gallons of fuel oil are required per hour from the 225-gallon fuel-oil tank, according to the manufacturer.

An electric igniter is located in the top of the heating hood to fire the fuel oil in the heating-hood area. The control mechanism is located on the switchboard panel of the auxiliary Wisconsin engine and is operated by an electric push button.

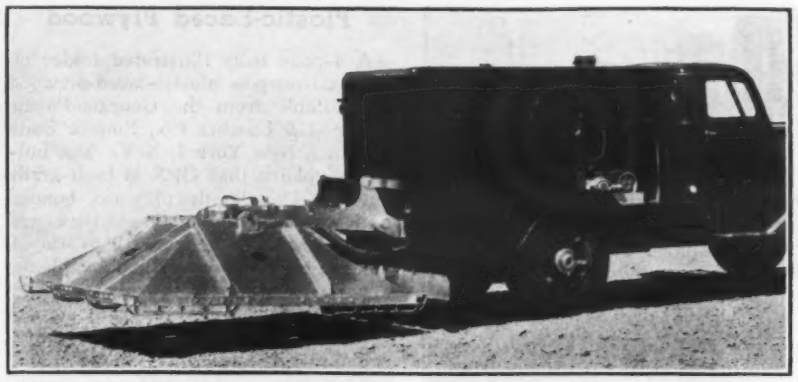
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 38.

Portable Belt Conveyors

A 4-page fully illustrated folder describing the Model 17 portable belt conveyor is available from Atlas Conveyor Co., Clintonville, Wis. This conveyor, the bulletin points out, may be used with 18 or 24-inch belts and is available in lengths from 30 to 60 feet center to center, in intervals of 3 feet. The frame is an all-steel lattice type of woven construction. The conveyors may be equipped with a variety of gasoline engines or electric motors.

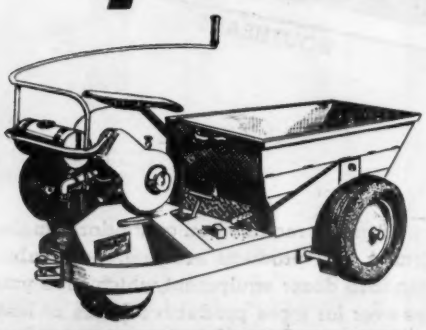
A series of photographs illustrate on-the-job operations, features of component parts, and overall views of the Model 17. Full specifications and lists of standard and optional equipment are included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 35.



Two improvements mark the new Clarkmoore asphalt-surface heater: the unit generates 1,780 degrees of heat, and an electric igniter fires its fuel oil.

7 job speeding improvements
GAR-BRO'S new power cart



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5. PROTECTED from bumps all around.
6. TOW BAR attachment optional.
7. TIMKEN ROLLER BEARINGS throughout.

PLUS 7-hp. 4-cycle gasoline engine; easy side-dumping on 5-ft. runways; steers through 180-degree arc on 4-ft. radius.
Replaces 4 hand-pushed carts or 8 wheelbarrows on any construction job. Pays for itself in 30 days!

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Please write for illustrative catalog on complete line of Viber equipment.

Concrete Bridge Has 42 New Spans

New Structure Parallels 38-Year-Old Bridge, Now Modernized to Provide Dual River Crossing

By RAYMOND P. DAY,
Western Editor

✦ AN exceptionally heavy volume of traffic near the city of Phoenix, Ariz., has made it necessary to modernize the 38-year-old concrete bridge which carries South Central Avenue across Salt River. The old bridge has now been dressed up to modern standards, and a completely new modern reinforced-concrete and steel bridge 2,260 feet long was constructed parallel to the old, to make a fast dual-lane structure across the river.

The job was a Federal-Aid Secondary project, bearing the number S2 (2) AFE637. Vinson Construction Co. of Phoenix was low bidder for the $778,215 contract with the Arizona Highway Department. Started October 15, 1948, the job was scheduled to be ready for traffic by September 1, 1949.

Vinson's contract included all renovating work in connection with widening the existing bridge, reconstructing the bridge approaches, construction of a new detour across the dry riverbed, removing existing bituminous-surfaced roadway and dip walls across the riverbed, and the construction of a new bridge. A lighting system was also included in the contract.

Design of New Structure

When the job was finished last fall, the casual motorist could not tell the difference from the top of the bridge between the new structure and the old. The old concrete guardrails were removed—blown away by explosives in an unusually precise example of the controlled use of modern explosives and detonators.

The new bridge parallels the old. It is 2,260 feet long, and is joined to the old bridge by a 9½-foot-wide raised median strip used as a pedestrian walkway. This median strip is "cold jointed" to the bridge concrete.

Some 42 reinforced-concrete piers on 50-foot centers carry the new bridge. These piers consist of narrow, heavily reinforced concrete sections, each fitted with a steel nose upstream, and poured monolithic with the bridge deck. Each pier rests on a footing pad 28 feet long, 6 feet wide, and from 2 to 3 feet 10 inches thick. A concrete block of variable height to make the bridge camber is set on top of the footing pad. All the piers are the same dimension from the top of the block to the deck, and are only 15 inches thick at the top of the block, approximately 25 feet below the normal streambed.

Two concrete abutments were built to connect the bridge to the new approaches. These abutments also go

(Continued on next page)

Vinson Construction Co. Photo

A truck-mixer places pier concrete in this general view of the two bridges—one new, one old—across Salt River near Phoenix, Ariz. Note structural excavation, the spoil pile, and the temporary detour at left.

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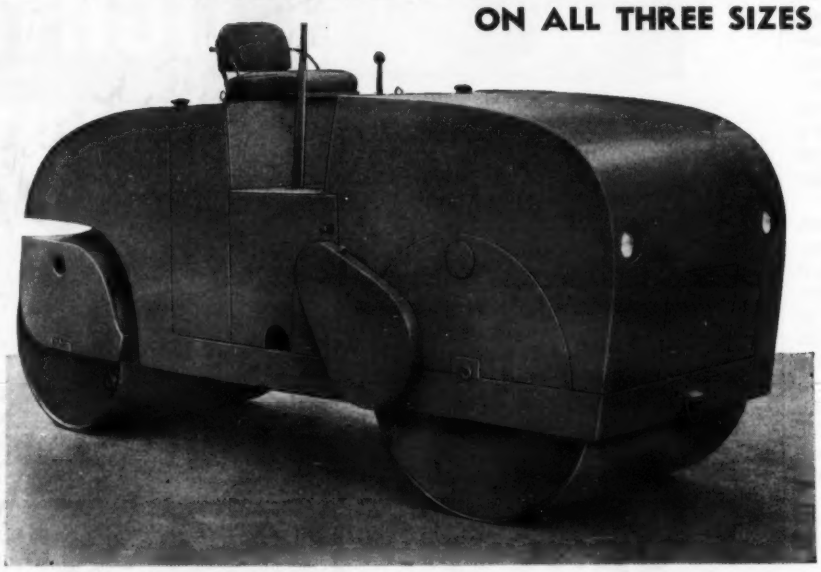

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WHICH ROLL
WITHIN 2 INCHES
OF BUILDINGS OR FENCES

SEALCOAT 3 to 5 TON VARIABLE WEIGHT TANDEM ROLLER. The HYDRAULIC STEERING LEVER and the clutch lever are conveniently located (left and right) to permit of easy, tireless handling when working in confined spaces or close (within 2 inches) *to buildings and fences to eliminate expensive hand finishing.*

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Handles all asphalt, gravel or other rough surface jobs with remarkable ease at money-making speed. Works in corners, confined spaces and maneuvers easily in small areas with short 91" wheel base. With but 1½" of frame extension on left side it can work WITHIN 2 INCHES from buildings, fences, etc. To eliminate hand finishing, has 13¾" ground clearance to allow hair-line finishing when working along curbs and other raised side obstructions. SINGLE LEVER HYDRAULIC STEERING permits fast, tireless handling. Geared bull wheel provides positive power transmission and allows faster starts and stops. Other features: Foot operated Parking and Service Brake, Electric Starter, Turns in 12' circle, Low center of gravity, Free access to working parts. Easily transported, etc.

MAJOR SPECIFICATIONS

POWER—Heavy Duty Industrial Engine—125 cu. in. piston displacement. 24.5 Brake Horsepower @ 1500 RPM; 27.8 Brake Horsepower @ 1800 RPM. Speeds: 2 forward and 2 reverse give 1.55 to 4 MPH range in either direction.
DIMENSIONS: Wheel Base 91". Length overall—132". Width overall—43". Tank height—57". Ground clearance—13¾". Left side clearance—1½". Right side clearance—3½".
ROLLERS: COMPACTION—Width—38". Diameter—40". Rolled and machined from ⅞" stock.
STEERING—Width—38". Diameter—30". Rolled and machined from ¾" stock.
COMPRESSION—Per lineal inch: Compaction Roller—155 lbs. with ballast. Steering roller—75 lbs. with ballast.
WEIGHTS: Shipping weight (approximately) 6500 lbs. Maximum weight (with ballast) 10,000 lbs. Extra metal weight—600 lbs.

WHEELER TANDEM ROLLER
3 to 4-TON VARIABLE WEIGHT

This is essentially the same in its sturdy construction and major operating features as the SEALCOAT Roller (above). Power specifications are identical. It is basically different in design and other minor specification differences given below.

MAJOR SPECIFICATIONS

DIMENSIONS: Wheel Base 7'10"; length overall 10'7"; width overall 3'6". Tank height 4'10". Ground clearance 10". Left side clearance 1½".
WEIGHTS: Shipping weight (approximately) 5500 lbs. Maximum Weight (with ballast) 8000 lbs. Extra metal weight 400 lbs.
COMPRESSION: Per Lineal Inch: Compaction roller, 150 lbs. with ballast. Steering roller, 70 lbs. with ballast.
ROLLERS: COMPACTION—Width—36". Diameter—37". Rolled from ⅞" stock.
STEERING—Width—34". Diameter—27". Rolled from ¾" stock.
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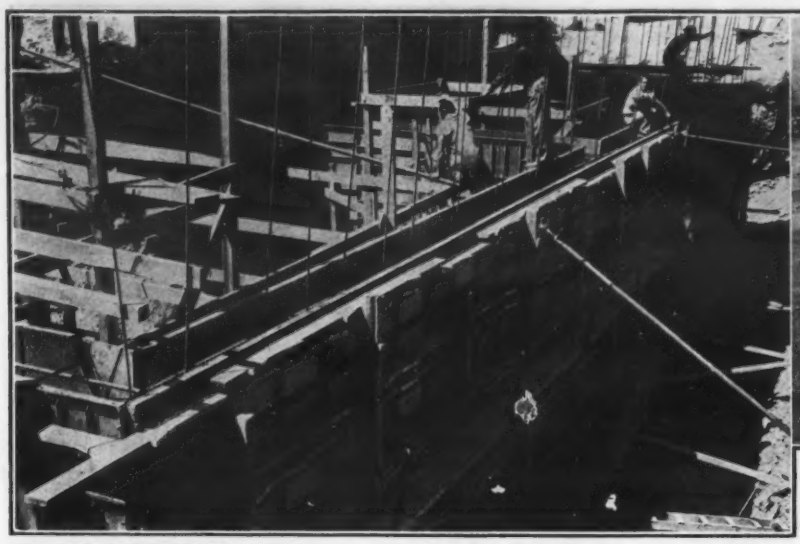

C. & E. M. and Arizona Highway Department Photos
Looking down across the south abutment of the New Salt River Bridge (left) we see carpenters building forms and bracing them for alignment. Above, some of the piers for the new bridge have just been poured—there are 42 of them.

New Concrete Bridge Built With 42 Spans

(*Continued from preceding page*)

down about 29 feet below the streambed.

The reinforced-concrete deck, 7 inches thick, is supported by four longitudinal 27-inch wide-flange 94-pound steel girders in each span. Expansion provisions include a 2-inch opening placed at 70 degrees. These joints begin 192 feet from each abutment, and continue at alternate intervals of 230 and 270 feet. A. F. Rath, bridge-wise Resident Engineer on the job, calculated what openings to set at the variable air temperatures under which the work was done. The 2-inch opening was figured for 70 degrees F.

The new roadway has a 1½-inch parabolic crown, and a similar roadway was shaped on the old bridge when it was re-decked with hot-mix asphaltic concrete. In order to carry two lanes of traffic safely, each bridge deck is 26 feet 2 inches wide curb to curb; 29½ feet wide over all. Dressy aluminum handrails lend beauty and grace to the finished job. No handrails are used for the pedestrian walkway in the center.

Major items in the job included 11,000 cubic yards of structural excavation, about 6,310 cubic yards of concrete, 875,000 pounds of reinforcing steel, 1,126,000 pounds of structural steel, 4,231 feet of aluminum handrail, 5,485 square yards of asphaltic-concrete paving, and miscellaneous items of imported borrow, aggregate base course, select material, and concrete sidewalk.

Interesting Field Layout

Because good field engineering is always so important to the builder's success in a bridge job, an excellent control layout survey was made early in the job, before construction began. A master traverse line was run, offset beyond the detour road east of the bridge. Chaining was done with a certified tape under atmospheric control conditions, and precise hubs were set at the proper intervals for the new piers.

Engineers then set a transit over these hubs, turned 90 degrees, and established permanent foresight points on the piers of the old bridge, high up near the deck. Precise levels were then run across the old bridge, and a constant reference elevation was painted on each pier. Thus when structural excavation began, the dragline operator could gage his depth accurately by painting a depth limit mark on his hoist line.

The old bridge, measured for length against this master line, checked out within ½ inch, proving that the old engineers back in 1910 were also capable of good contracting. The 38-year-old concrete was generally quite sound.

Old Guardrail Blown Off

Removal of the existing concrete guardrails presented a ticklish problem. The specifications demanded no damage to the old bridge deck. Along the west side of the old bridge run coaxial cables carrying radio and telephone lines. It was clearly a job that required powder, but powder under precise control.

(*Continued on next page*)

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Let a Texaco Lubrication Engineer help you simplify and improve your maintenance lubrication procedures. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd St., New York 17, N. Y.

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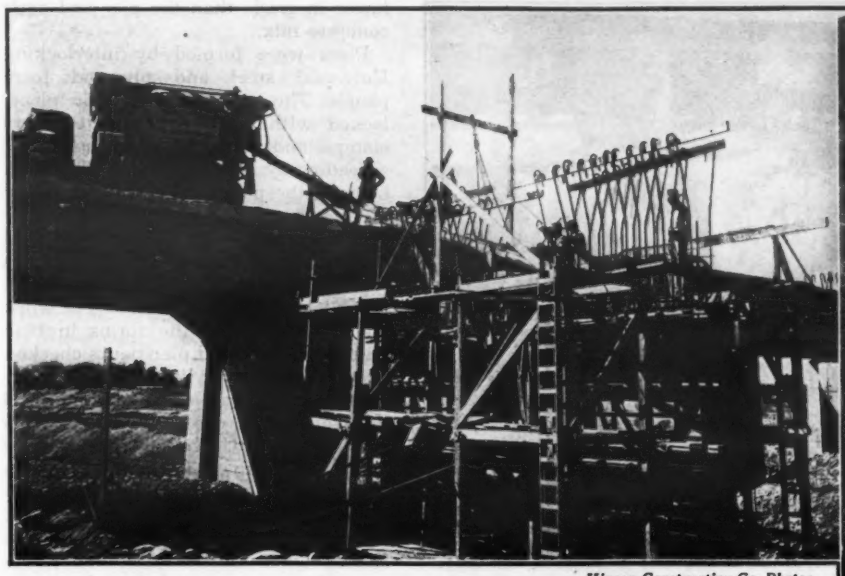


Vinson Construction Co. Photos

Above, a typical pier pour on the Arizona bridge job, complete with truck-mixers, scaffold, and chutes. The workmen in the photo at right are vibrating concrete around the steel.

Lubricants and Fuels
FOR ALL CONTRACTOR'S EQUIPMENT

D. W. Jaquays, a Phoenix explosives expert, was summoned. He looked at the job, expressed a willingness to take it, and arrangements were speedily made to subcontract this part of the work to him.

A narrow pedestrian walk lay along the base of the old 4-foot-high guardrail. Jaquays directed his men to drill vertical 1½-inch holes in this base. The holes were spaced on 18-inch centers, and were drilled 9 inches deep. Jaquays calculated his breakage lines from that point would angle downward and break the concrete clean at the deck line. Narrow 2-foot undrilled spots were left over the piers so the guardrail would be supported until reinforcing steel could be burned off.

Jaquays personally directed the work. He loaded the holes with 1/5 to 1/4 stick of 40 per cent strength Gelamite powder, and used Atlas Rockmaster caps in each hole. In order to get explosive action which would shatter the concrete and strip it clean from the steel, he used a Zero cap in the center hole of each 50-foot span, alternating on either side of this cap with A-caps, followed by alternate zeros again in turn. While the time interval between Zero and A-caps is measured in milliseconds, the loading arrangement did a beautiful job. The 50-foot spans were shot at once with a hand blasting machine. The concrete cracked clean, it left a clean line at the deck without damage, and it stripped clean off the reinforcing steel. After a shot was fired, a welder had only to step in and burn off the steel. The narrow pedestals were then jackhammered out, the steel was cut, and the whole wall dropped down in the riverbed where it could be broken up and hauled away.

The west wall was more difficult. Directly underneath the wall ran the important coaxial cables. It was of course imperative that these lines not be damaged. To comply with that provision, Jaquays shot the wall in the same manner but covered the cables with a protective wood platform; then dropped the wall on the bridge deck toward the inside, where it could be broken up and hauled away.

With traffic using the near-by bituminous detour, it was necessary as a safety precaution to halt the cars whenever one of the shots was pulled.

Dragline Mucks Out Piers

Structural excavation for the piers consisted of a series of 42 holes about 30 feet wide, 40 feet long, and 30 feet deep, with side slopes of about ½ to 1. These excavations were made to within a foot of project grade by a 1½-cubic-yard Koehring dragline, with some of the clean-up work done by a clamshell bucket.

The excavated material was stock-

(Continued on next page)

New Concrete Bridge Built With 42 Spans

(*Continued from preceding page*)

piled by casting to one side, where the material could later be reclaimed and used as backfill.

Vinson's General Superintendent E. F. Brophy realized that any heavy rain could put water down Salt River in sufficient quantity to endanger his construction area. He also feared that ground water would be found. Because of these considerations, he kept the job so well "tightened up" that only four piers were opened at one time. As a rule, excavation was done in about a day on the first of a series; hand grading with shovels and the installation of foundation forms followed on the second; reinforcing-steel erection and wall forms for the pier followed on the third; and concrete pouring was done on the fourth. The job moved so rapidly that a pier was finished on an average of every 1½ days all the way across the river.

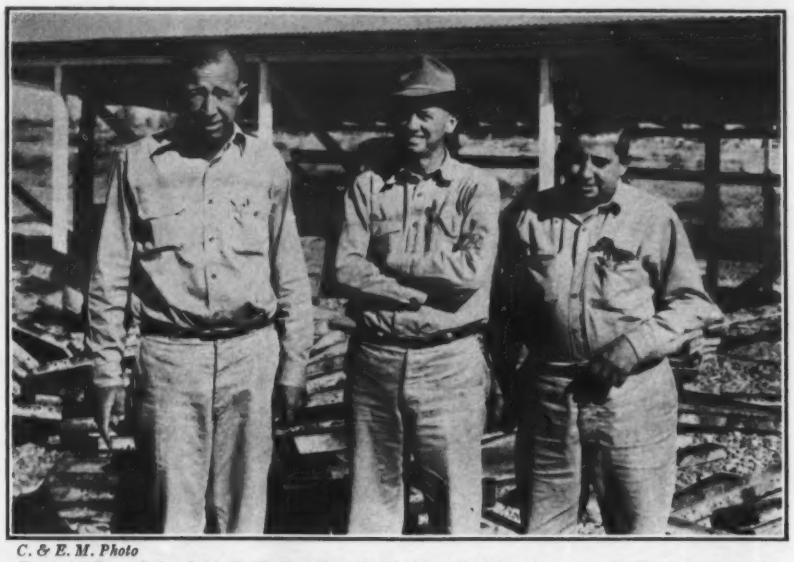
Fine-grading to establish a clean line at project depth removed about 12 inches of material. Streambed material in Salt River is mostly sand, gravel, and some small boulders. The final grades, about 30 feet below streambed, were checked by using 36-foot level rods made out of 1½-inch pipe, with the engineer's level up on the streambed. The rod was held plumb by using cross string lines as a reference point.

Later, after the piers were poured, the stockpiled material was moved in for backfill by a pair of D8 Caterpillars with Caterpillar bulldozer blades. All the piers except two were placed on a predetermined elevation. The two on which changes were made involved only 1 and 2 feet of overdepth excavation. No pile driving was necessary on the job.

The floods and ground water under serious consideration failed to materialize, fortunately, and the nearest example of subsurface water was several pockets of wet sand.

Concrete Forming

Concrete forms for the pier footings were built up of 2 x 12-inch lumber, with 2 x 6-inch studs and Bosco bands to tie the corners of the pour together. Footing concrete was, of course, covered later by backfill, and a 6-sack concrete mix was used here, somewhat lower in grade than the pier and deck concrete mix.



C. & E. M. Photo

General Superintendent E. F. Brophy (left), Resident Engineer A. F. Rath, and Office Manager Jim McFeeters inspect and discuss some of the Universal forms used on the Arizona bridge job for which Vinson Construction Co. was the contractor.

Piers were formed by interlocking Universal steel and plywood form panels. The panels were set in place, locked with Universal patented form clamps, and then tied together against spreading by steel form bolts. The main body of the panels was braced further by 4 x 6 wales, to make a perfectly rigid form for each pour. Each form was checked at the concrete line by transits before each pour, and cable bridles with turnbuckles leading to concrete work on each side held the forms in true alignment. Finished pier pours checked exactly on the hair line of a transit.

Deck forms were suspended on 2 x 6 joists at 24-inch centers, with the joists suspended on Universal wire saddles from the structural-steel girders. Sheets of ¾-inch plywood 4 x 8 feet were then nailed to the joists to form the deck forms. No deck concrete had been started when CONTRACTORS AND ENGINEERS MONTHLY visited the job.

(*Concluded on next page*)

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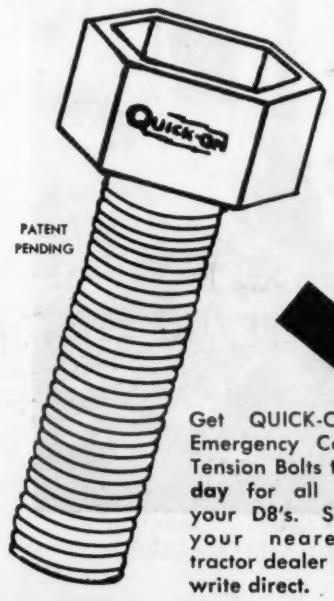

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Get QUICK-ON Emergency Cap Tension Bolts today for all of your D8's. See your nearest tractor dealer or write direct.

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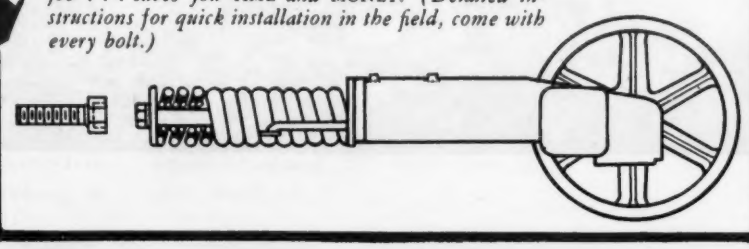

Silver Booster MANUFACTURING COMPANY

812 SOUTH FLOWER STREET, BURBANK, CALIFORNIA

Forming the high, slender piers was somewhat of a unique field feat, because they had to be held true despite their narrow dimensions and heavy reinforcing steel between the forms.

Concrete Is Truck-Mixed

All concrete for the new work was truck-mixed and delivered by two ready-mix commercial concrete concerns: Arizona Sand & Rock Co., and Superior Ready Mix Concrete Co. Cement, concrete aggregates, water, and air-entraining material were furnished by these companies.

Most of the concrete was called a Class D mix, with 6½ sacks of cement per cubic yard. The mix was based on 178 pounds of sand, 280 pounds of aggregate, and 5.2 gallons of water per sack of cement. A breakdown of the aggregate design showed 20 per cent of ½-inch rock, 60 per cent of 1-inch, and 20 per cent of 1½-inch.

Truck-mixers poured by gravity wherever possible, usually working from the top of the old bridge deck. The concrete was chuted to the placing point, using long flexible elephant trunks to reach the bottom of the piers. In a few inaccessible locations, the Koehring crane was used with a 1-yard transfer bucket to reach the pour points; this was generally the procedure for most of the pier footings.

The concrete was stripped the second day following the pour, and cured by a spray application of Sealtex watertight membrane solution.

Deck concrete was also placed by truck-mixers, with a final pulled-belt finish after the material was screeded off and floated.

Personnel

The South Central Avenue Bridge was designed and supervised under the general supervision of W. C. Lefebvre, State Highway Engineer, with R. A. Hoffman as Engineer of Bridges, J. A. Parker as District Engineer, and A. F. Rath as Resident Engineer.

E. F. Brophy supervised field contract work, assisted by Jerry Snow and Les Benton, with Bill Obersom as Carpenter Foreman and Jim McFeeters as Office Manager.

AASHO to Ask Congress For $810,000,000 of F-A

The American Association of State Highway Officials plans to recommend to Congress a Federal-Aid highway program amounting to $810,000,000 yearly—compared to the $450,000,000 provided yearly under authorizations which expire with fiscal 1951. It will recommend $210,000,000 for the Interstate System, with a Federal-state contribution of 75-25 per cent respectively. It will ask for $270,000,000 for the primary system, $180,000,000 for the secondary, and $150,000,000 for the urban—all on the 50-50 matching basis.

The AASHO will ask that distribution of the Interstate System funds be based entirely on state populations, with a provision that no state shall receive less than 0.75 per cent. It will suggest that states desiring to complete their section of the Interstate System more rapidly than provided for in the proposed program, float general revenue bonds to construct toll-free facilities, and be permitted to apply future Federal-Aid allocations for the Interstate System to retire the principal but not the interest of such bonds.

As for primary and secondary systems in the AASHO program—if local conditions in a state warrant emphasis on one of these systems, the state should be allowed to shift up to 25 per cent of the other system's funds to that system, with permission of the Bureau of Public Roads. The Association will also propose that $100,000,000 be made available to the states as an advance for right-of-way purchases, this money to be repaid over a period of years.

Engines and Machines For Drilling Operations

A 4-page catalog on engines and machines for drilling operations is offered by the Young Engine Corp., P. O. Box 532, Canton 1, Ohio. It describes two of the company's products: gasoline and diesel drilling engines and under-road boring machines.

The Young under-road boring machine is fundamentally a horizontal rotary drill, using the pipe or casing that is being installed as a medium for carrying the rotating cutter heads. This casing usually remains in the ground when the job is completed. All pipe sizes up to 30-inch diameter may be handled with this machine. Since the surface and the roadbed are not disturbed, traffic need not be delayed in any way. A full description of the way this machine works is given in the catalog.

Each of the drilling engines is a complete and compact unit mounted on a welded-steel skid frame for permanent alignment and easy moving. Power output of the 6 and 8-cylinder heavy-duty engines ranges from 85 to 350 hp. Brief specifications are given for these machines.

This literature may be obtained from the company, or by using the Request Card on page 16. Circle No. 28.

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Roper operates simply from any jeep or tractor with hydraulic lift. Operator works from driver's seat, can quickly spot digger. No winches to fool with.

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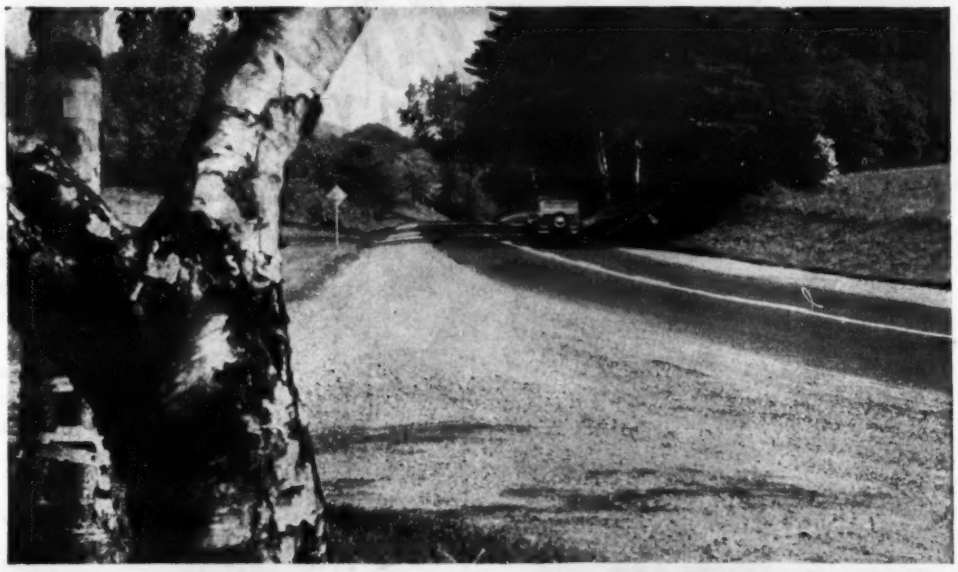

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The slightly granular, "tractionized" surface of TARVIA road tar pavement gives tires a firm tread-hold for safer driving.

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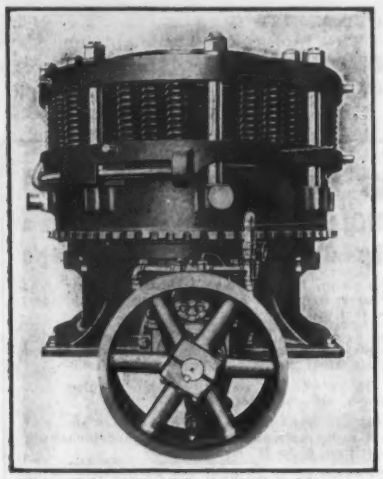


This Telsmith 48-inch Style FC fine-crushing Gyrasphere is one of two new crushers just announced by Smith Engineering Works, Milwaukee, Wis.

Two Crushing Units Have New Features

Two new models of the Telsmith Gyrasphere crusher—the Style S standard Gyrasphere and the Style FC fine-crushing Gyrasphere—have just been announced by The Smith Engineering Works, Milwaukee 12, Wis. They include many new improvements, incorporated after several years of testing in actual service, which give greater capacity, a more uniform cubical product, and a lower crushing cost per ton, the manufacturer reports.

In the new Style S standard Gyrasphere, larger roller-thrust bearings are now located at the top of the eccentric and transmit crushing pressures from the bottom of the head directly into the main frame. A longer crushing stroke gives greater capacity. The eccentric bearings have more bearing area in the upper zone of greatest crushing pressures. Longer springs are used, to pass larger pieces of tramp iron. The main drive gear is located at the bottom of the eccentric instead of at the top, to assure alignment of gears and longer life for these parts. The new model is more accessible for maintenance purposes. The Style S standard Gyrasphere is available in 24, 36, and 48-inch sizes, with either coarse or medium bowl.

The new Style FC fine-crushing Gyrasphere has the same structural improvements as the Style S, plus several additional fine-crushing features. It comes equipped with a new feed distributor for even feeding and uniform product. It has more springs to handle greater crushing pressures. It has a different shape of mantle and concave with a longer parallel crushing zone to give a finer product. New Gun-Lock mantle and concave holding devices are automatically self-tightening and make these parts easier to change. The Style FC fine-crushing Gyrasphere crusher is also available in 24, 36, and 48-inch sizes, with either medium or fine bowls.

A new catalog, No. 274, describing and illustrating these two crushers may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

The Jochim 8B rock picker rakes, lifts, and deposits in its hopper 2¼-inch-diameter stones or rocks weighing more than 250 pounds.

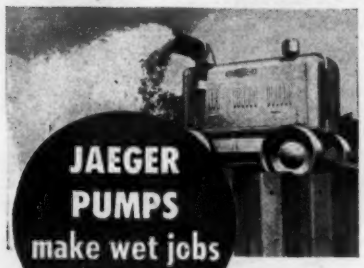
Surface-Rock Picker

The Model 8B Jochim rock picker made by Minn-Kota Mfg. Co., 201 17th St. N., Moorehead, Minn., is designed to pick surface stones from 2½ inches in diameter to rocks weighing more than 250 pounds. The picker has an 8-foot swath composed of 26 spring-steel tines which gather rocks and deposit them in a 3,000-pound-capacity hopper in rear. The rake is hydraulically operated by a pump mounted on the power take-off or from hydraulically equipped tractors. The rock picker is easily drawn by any size of tractor, according to the company. This machine, 9¼ feet wide x 14 feet long, can be carried on an average truck.

The frame is constructed of 5-inch heavy-channel structural steel, electrically welded for added strength. The depth-control bar for the tines may be adjusted by means of turnbuckles, to permit work in different types of soil. The rear hopper is dumped by a lever release.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 53.

New 2" aluminum pump weighs 105 lbs., pumps 9000 gph . . . Gives high head performance for price of low head pump.



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A fully convertible machine in the 1 yard class—shovel, crane, clamshell, dragline, hoe.
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All-welded 19 and 21 ft. lengths. Square—heavy duty dipper sticks.
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Yes, on the new Lorain-50 the hydraulic coupling (fluid clutch) power-take-off is standard equipment, at no extra cost! — In operation this means (1) the engine can't be stalled under any digging conditions; (2) digging impacts and stresses are absorbed before they reach the operating mechanism . . . And the Lorain-50 brings you many other NEW features, in addition to those shown . . . Your Thew-Lorain distributor has the complete story ready for you — today!

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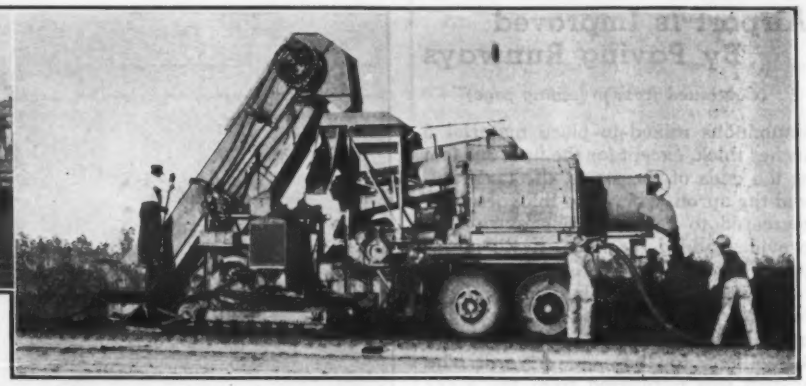

Seaboard Construction Co. Photos

A Tampo 13-wheel rubber-tire roller (above) pulled by an International ID-9 compacts fill at the Brunswich Airpark. At right is the Barber-Greene Model 848 traveling plant which mixed sand-asphalt for the runway base.

Airport Improved By Paving Runways

Bituminous Mixed-In-Place Base Done With Traveling Plant; Later Field Slopes Are Fertilized and Seeded

✦ BRUNSWICK Airpark, a Class I airport serving Brunswick, Ga., has been improved with the bituminous paving of its two runways. The Airpark, located 2 miles northeast of Brunswick, county seat of Glynn County in southeastern coastal Georgia, was built five years ago during the war. Two steel hangars, 35 x 200 feet, were also built then, but the runways, while graded and drained, were never paved. One of these bare earth strips, 1,900 feet long, was laid out in a northeast-southwest direction. The other, northwest-southeast and intersecting the first at right angles, is 2,350 feet long.

The improvement, sponsored by the Brunswick-Glynn County Airport Commission, is financed from three sources. The Federal Civil Aeronautics Administration stands half the cost, while the remainder is divided equally between the county and city. The new construction, which was done by the Seaboard Construction Co. of Brunswick, Ga., included clearing, grading, drainage, paving, and seeding. The cost will amount to around $110,000.

Operations got under way in August, 1948, and the grading and drainage items were finished that season. The mixed-in-place base was laid down during December and January, but it was re-shaped and sealed last spring along with the seeding of the shoulders and slopes. Both runways were paved for their full original length and to a width of 75 feet. Ultimately, both runways are expected to be extended to 4,500 feet in length, and their width increased to 150 feet.

Clearing and Grading

Clearing and grubbing took in 9 acres, extending out practically to the ultimate limits of the runways. The small growth encountered was removed by two Caterpillar dozers, a D8 and a D7, which cleared for 150 feet on each side of the center line. Drainage included 18 and 24-inch-diameter reinforced-concrete pipe which empties into a large outfall ditch at the northeastern end of the field. From here the natural flow is into a creek, and thence to a swamp lying east of the Airpark.

Average elevation of the field is 14 feet above mean sea level. The grading work added about 1½ feet of fill to the runways for their full 300-foot width. The material, sandy in nature, came from the ditches that were dug around the edges of the site and from borrow pits that were tapped to a shallow depth. The larger ditches were dug by a Bay City dragline equipped with a 35-foot boom and a Page ¾-yard bucket. The material was moved by two tractor-drawn scrapers—a 12-yard Wooldridge with a D8, and an 8-yard LeTourneau with an International TD-14 tractor. Hauls were up to 1,000 feet.

The material was naturally wet from the excavation, and compacted well under the hauling equipment. The fill was also rolled by a Tampo 13-wheel rubber-tire roller pulled by an International ID-9 rubber-tired tractor. Two Caterpillar No. 12 motor graders did the shaping.

Bituminous Base

Paving for the runways consisted of

(*Continued on next page*)

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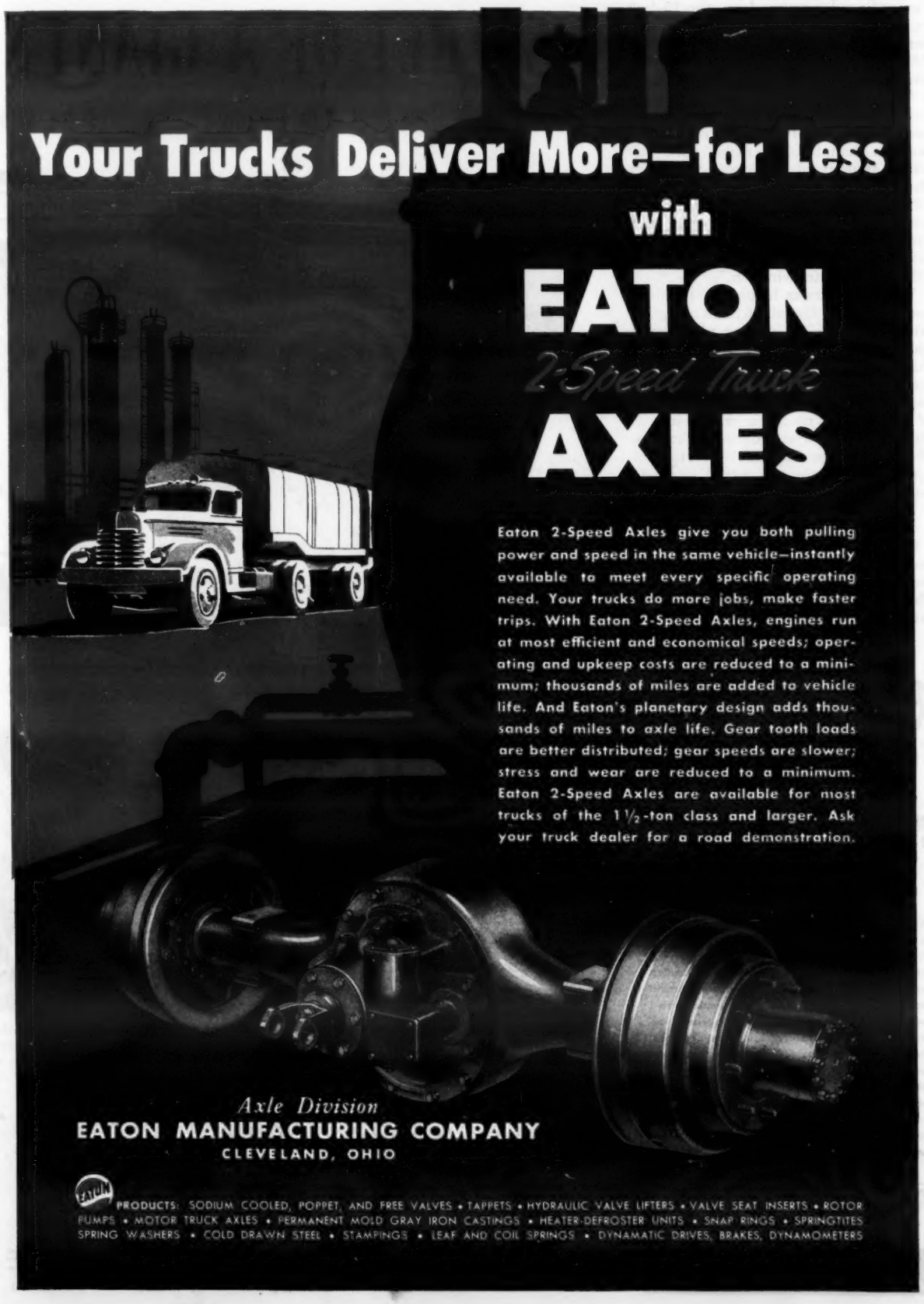
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Airport Is Improved By Paving Runways

(*Continued from preceding page*)

bituminous mixed-in-place material 5 inches thick, except for the final 300 feet at the ends of the strips, the taxiways, and the apron, where the thickness was increased to 6 inches. The extra inch provides added strength at the areas where the pavement is subjected to heaviest loadings. The base is composed of local sand obtained at the field, mixed with RC-3 asphalt at the rate of 3.2 gallons to the square yard. The asphalt was purchased from the Mexican Petroleum Corp., and was hauled 80 miles from Savannah in two 4,500-gallon transport trucks. At the site it was transferred to a 15,000-gallon storage tank by a Littleford 3-inch pump and a Cleaver-Brooks tank-car heater. The latter unit also kept the bitumen in the tank heated so that it was used at temperatures ranging from 135 to 150 degrees F.

In the meantime the two No. 12 graders were building up three windrows of sand running down the 75-foot runways. One windrow was in the center of the strip, and the others were 12½ feet in from each edge; they were thus 25 feet apart. The windrows were 3 feet high, 7½ feet wide at the bottom, and 5 feet wide at the top. Their cross section was carefully checked with a wooden template to make sure the exact amount of sand was there for the mixing. A Barber-Greene Model 848 traveling plant then straddled the windrow, picked up the sand and mixed it with the RC-3 asphalt, and laid the material out behind it in another continuous windrow.

Two tank trucks holding 790 gallons each kept the traveling plant supplied with bitumen. The mixing plant itself had a 700-gallon storage tank and a pump to transfer the asphalt from the feeder trucks. The flow of asphalt was regulated to match the traveling speed of the mixing machine, which moved along under its own power at the rate of 51 inches per minute. An average of 1,500 tons of base was mixed in an 8-hour day.

Spreading and Shaping

Enough material was mixed so that the loose depth of base course was 2 inches more than the compacted depth. Thus for the 6-inch-deep areas, the sand-asphalt mix was spread to a loose depth of 8 inches. Spreading was done by the motor graders, and the necessary compaction was achieved by the rubber-tire roller. Since this part of the work was done in the middle of the winter, the base could not be shaped to final section. However, the runways were available for use throughout the winter period.

Seaboard Construction Co. Photo
This Seaman Pulvi-Mixer pulled by a Fordson tractor is shown mixing fertilizer into the soil at the Brunswich Airpark, preparatory to seeding.

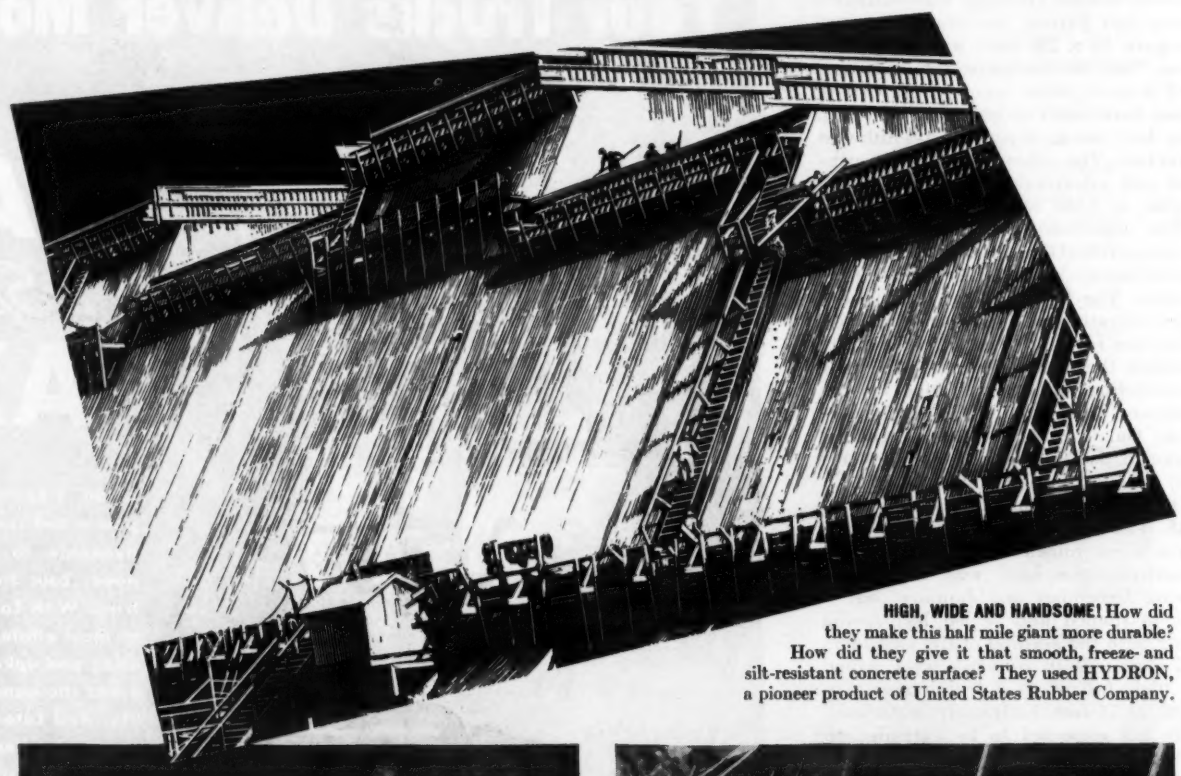
When the weather warmed up well last May, the runways were plowed up and the moisture present in the mix evaporated in the heat. The base was worked over by a John Deere Killefer harrow and a Seaman Pulvi-Mixer until the mixture had 'a fine texture and all the lumps were removed right down to the subgrade. Then the motor graders put the base back in shape, with the rubber-tire roller looking after the compaction.

Next the surface was covered with AC-15 asphalt applied at the rate of 0.2 gallon to the square yard at 275 degrees F. An Etnyre 1,350-gallon distributor mounted on a White truck applied the bitumen in four lanes—three at 20 feet and one at 15 feet. It was covered with ¼-inch slag, 12 pounds to the square yard, put on by a Buckeye spreader hooked to the back of trucks. The slag was shipped by rail from steel mills in Alabama to a siding of the Atlantic Coast Line Railroad, 2 miles from the Airpark. There it was unloaded to the trucks by an Osgood crane equipped with a ½-yard clamshell bucket. After the slag was spread

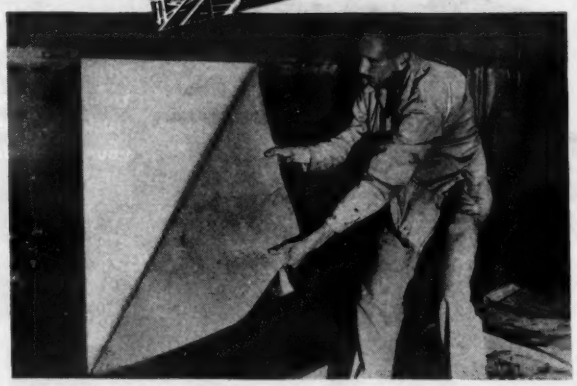
(*Concluded on next page*)

SECRET OF A GIANT'S STRENGTH

Giant Norfolk Dam built with Hydron Form Linings for stronger, pit-free concrete surfaces



HIGH, WIDE AND HANDSOME! How did they make this half mile giant more durable? How did they give it that smooth, freeze- and silt-resistant concrete surface? They used HYDRON, a pioneer product of United States Rubber Company.



LEARN THE SECRET of Hydron! It's a flexible absorptive form lining only 0.08 of an inch thick. It absorbs excess water and eliminates trapped air. Concrete laid against Hydron is smoother—lasts longer.

HOW IT'S DONE! Hydron is mounted to wooden forms by *rapid fire staple guns;* to metal frames, with special adhesive. Comes in a flat box, 4 x 6 ft. Easy to handle, easy to cut or trim for any giant job!

Engineers and contractors who have used Hydron Form Linings report that Hydron adds *years* to the serviceable life of concrete. Yet, the *total* cost, including a satisfactory profit, is only 12¢ to 16¢ per square foot. For more information write Mechanical Goods Division,

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Expansion and contraction joints can be effectively sealed against moisture infiltration at the subgrade with BASEAL—the preformed sealing strip. BASEAL is a Para-Plastic coated saturated felt sheet with a high degree of cohesive, adhesive, resilient and plastic properties. Bond is maintained at all temperatures from 0° to 180°, regardless of moisture conditions. BASEAL is a premolded development of our widely used Hot-Poured PARA-PLASTIC—the superior rubberized asphalt joint sealing compound. BASEAL is available in any width and length in 3/8" thicknesses.

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Write for complete information on BASEAL, Premolded Para-Plastic and Hot-Poured Para-Plastic.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST., CHICAGO 38, ILL.

over the bitumen, it was rolled in by a Galion 8-ton tandem roller.

Fertilizing and Seeding

The field was seeded over 40 acres, extending from the edge of the runway paving to the toe of the front slopes. First, however, the fertilizer was applied at the rate of 200 pounds of super phosphate and 200 pounds of nitrate of soda to the acre. It was applied in 15-foot lanes from a spray unit hooked to the back of a truck. The fertilizer was mixed into the soil to a 2-inch depth by a Seaman Pulvi-Mixer pulled by a Fordson tractor. This operation softened the dirt, threw out any loose roots, and left the ground with a smooth surface.

Then a Culti-Packer, drawn by a Ford truck, was worked over the area to be seeded. This machine, moving in 10-foot lanes, made shallow depressed rows to receive the seed which was sowed by a hand machine in swaths from 7 to 9 feet in width. Unhulled Bermuda grass seed was used, sowed at the rate of 15 pounds to the acre. The Culti-Packer then made another pass over the seeded areas, covering the rows with from ¼ to ½ inch of dirt to prevent the seed from blowing away.

Quantities and Personnel

The major items in the airport contract included the following:

Excavation, unclassified	48,000 cu. yds.
Excavation, open-ditch	5,700 cu. yds.
Reinforced-concrete pipe, 18-inch-diameter	317 lin. ft.
Reinforced-concrete pipe, 24-inch-diameter	640 lin. ft.
Stabilized base, 6-inch thick	31,200 sq. yds.
Stabilized base, 5-inch thick	25,330 sq. yds.
Aggregate cover material	365 tons
Fertilizing and seeding	150,000 sq. yds.
Bitumen, RC-3, for base course	142,800 gals.
Bitumen, AC-15, for seal coat	11,300 gals.

The Seaboard Construction Co. of Brunswick, Ga., H. J. Friedman, President, averaged a 12-man crew on the project, working a 48-hour week. W. E. Goff is General Superintendent for the contractor, while Clinton Crosby was Job Superintendent.

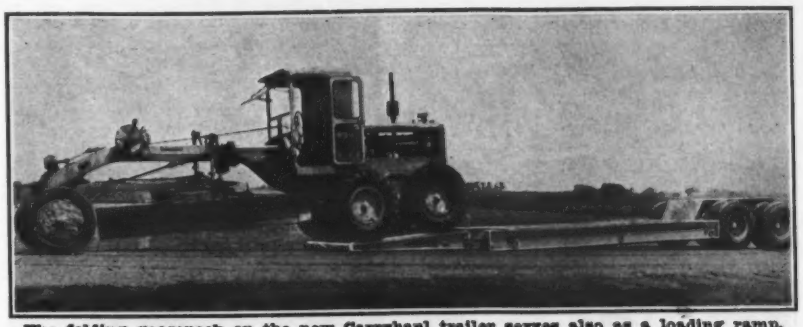
The improvements at the Brunswick Airpark were designed by Sverdrup & Parcel, Consulting Engineers from St. Louis, Mo.

For the Civil Aeronautics Administration, Herbert G. Spencer is District Airport Engineer of the Second Region with headquarters at Atlanta, Ga.

Three-Ton Vehicle Crane

A 4-page illustrated folder on the Han-D-Crane has been prepared by the Construction Machinery Co., of Waterloo, Iowa. This crane, the bulletin points out, is designed to lift, load, unload, or move heavy equipment or supplies. Its method of counterbalancing utilizes the weight of the towing vehicle, and its cradle-boom construction permits handling of loads up to 2 tons, according to the manufacturer. Features, specifications, and photographs of job operations are included in Bulletin HC-49.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 65.



The folding gooseneck on the new Carryhaul trailer serves also as a loading ramp. It is raised by a winch on the truck-tractor from loading-ramp to towing position.

Folding Gooseneck Makes Trailer Ramp

The latest development in the line of Carryhaul trailers made by Martin Machine Co., Kewanee, Ill., is a patented folding gooseneck which, when lowered to the ground, forms a loading ramp. This new method of front-loading a Carryhaul trailer of low platform height provides greater clearance for viaducts, bridges, and wires, allowing fast and safe movement between jobs, the company says.

In operation, the folding gooseneck is lowered to form a loading ramp which provides a uniform incline from the ground to the trailer platform. When the trailer is loaded, a power-operated winch on the truck-tractor raises the gooseneck to towing position. The entire procedure is a one-man operation.

An additional feature of this trailer —which is available in capacities up to 100 tons—is the patented tandem axle assembly which is completely suspended in rubber for flexibility and independent wheel action. This assembly has no grease fittings, requires no lubrication, and has no pins or bushings to be replaced.

Further information may be secured direct from the company. Or use the Request Card at page 16. Circle No. 24.

Dolly Gray of NRMCA Dies

C. (Dolly) Gray, immediate Past President of the National Ready-Mixed Concrete Association, died on November 6 at his home in Indianapolis. He was Chief Engineer of the Indiana Highway Commission from 1920 to 1925, and before becoming NRMCA President, he was Manager of the Indiana plants of the American Aggregates Corp. At the time of his death he was President and owner of the Ready Mixed Concrete Corp. of Indianapolis.

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Remember, there's a Stoody Alloy for every abrasive wear problem. Ask your dealer for recommendations or write direct. We're glad to help.

Retard it with STOODY ALLOYS

For best all-around shovel protection we recommend Stoody Self-Hardening 21. Besides possessing good impact strength, its high alloy content insures excellent abrasion resistance. These features coupled with low price give most protection per dollar. Try Stoody Self-Hardening 21 today

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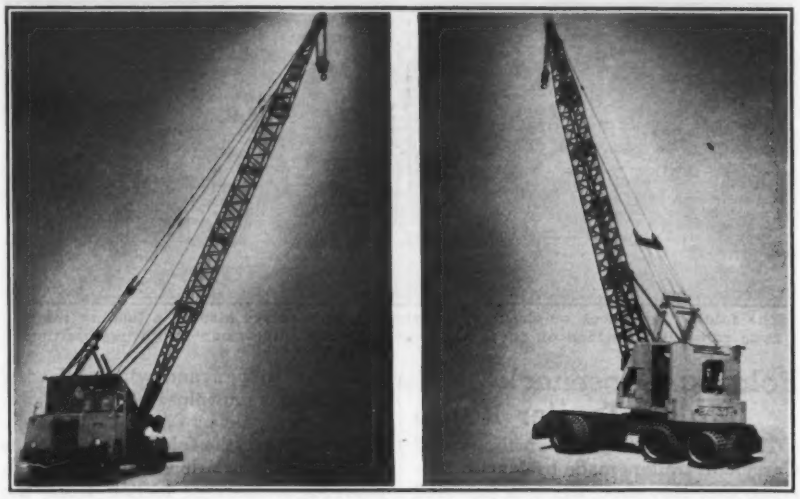
New 25-Ton Crane Has Two Mountings

A 25-ton crane available with two types of pneumatic-tired carriers extends the line of excavating and material-handling equipment made by Bay City Shovels, Inc., Bay City, Mich. The two units are called the Model 190-T61 CraneMobile and the Model 190 CW CraneWagon.

The CraneMobile is mounted on a specially designed, three-axle crane carrier powered by a separate heavy-duty automotive-type gasoline engine with a displacement of 779 cubic inches. It is equipped with ten 12:00 x 20 tires and a Timken tandem rear-axle unit with through worm drive. The main and auxiliary transmissions provide 12 forward speeds up to 35 mph and 3 reverse speeds. Air brakes are furnished for all wheels, and an emergency brake is mounted on the driveshaft. Outrigger beams, fore and aft of the rear axles, are of the sliding type. The carrier has a coupe-type glazed cab of modern design.

The CraneWagon is a self-propelled one-engine crane, mounted on a 6-wheel carrier equipped with twelve 12:00 x 20 tires. It also has air brakes on all wheels. Wheel hubs and brake drums are Timken-bearing-mounted. Controls for operating, steering, braking, and transmission shifting are accessible from the operator's seat at any cab position.

The crane machinery or upper works of both models is powered by a heavy-duty 517-cubic-inch-displacement industrial-type gasoline engine. Engine, machinery, and A-frame supports are mounted on a full-length one-piece unit-cast alloy-steel rotating base or bed plate. Hoist and auxiliary hoist drums are ball-bearing-mounted on separate shafts.



A new 25-ton Bay City crane with two types of pneumatic-tired carriers—the Model 190-T61 CraneMobile, left, and the Model 190 CW CraneWagon, right.

Numerous safety features have been incorporated in these 25-ton Bay City cranes. An independent précision boom hoist, operated by separate friction clutches, raises and lowers the boom and load only under power, without use of pawls and brakes. Telescopic boom back-stops provide additional safety when the boom reaches the maximum operating angle. A special load-lowering mechanism is furnished for accurate control in the handling of heavy loads. Safety guards installed over the clutches and main gears are covered with protecting guards. A positive swing lock engages in any position of the circle, securely locking the rotating base to the lower base or carrier structure, thus doing away with a mechanical brake. The 25-ton swivel hook is equipped with safety snap.

The boom is of deep section, consisting of basic 30-foot two-piece pin-connected sections and intermediate 5, 10, and 20-foot sections. The boom head is equipped with three ball-bearing-mounted sheaves, as is the load block, permitting use of 2, 4, or 6 parts of line. Adjustable jibs are available in 15 and 30-foot lengths.

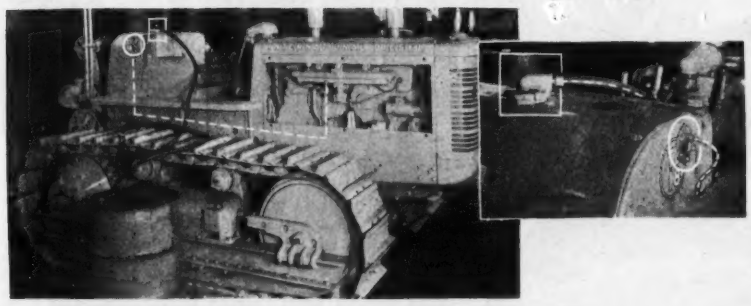
A catalog including detailed specifications and lifting capacities may be secured direct from the company. Or use the Request Card at page 16. Circle No. 4.

Gulf Oil Sales Manager

Lucien F. Craig has been named General Sales Manager of special products by Gulf Oil Corp., of Pittsburgh, Pa. His new post was created in a reorganization of the firm's domestic sales program. Mr. Craig will direct sales of such products as asphalt, butane, propane, and stock oil. He was formerly Assistant General Manager of fuel-oil sales.

FILL-A-MATIC

The Automatic Tractor Re-fueler



FILL-A-MATIC CREATES A VACUUM in the fuel tank by utilizing the suction power of the engine. The tank fills at the rate of 7 to 9 gals. per min., engine idling on crawler type tractors and 5 gals. on farm tractors. The suction is automatically cut off when the tank is full, this means no over-flo and elimination of fire hazard. The fuel is strained as it passes into the tank thru the FILL-A-MATIC tank cap, this means a clean fuel system.

FILL-A-MATIC IS EASY TO INSTALL because there are few parts. A float operated suction valve mounted in the top of the fuel tank, a 3/8" copper suction line connecting the float valve to the manifold, a 1/8" x 3/8" fitting at the manifold, a small shut-off valve in the copper line near the tank, a fuel tank cap with 70 mesh strainer built in and 12 ft. of 3/4" moulded rubber hose static wired and coupled to the tank cap is the complete equipment.

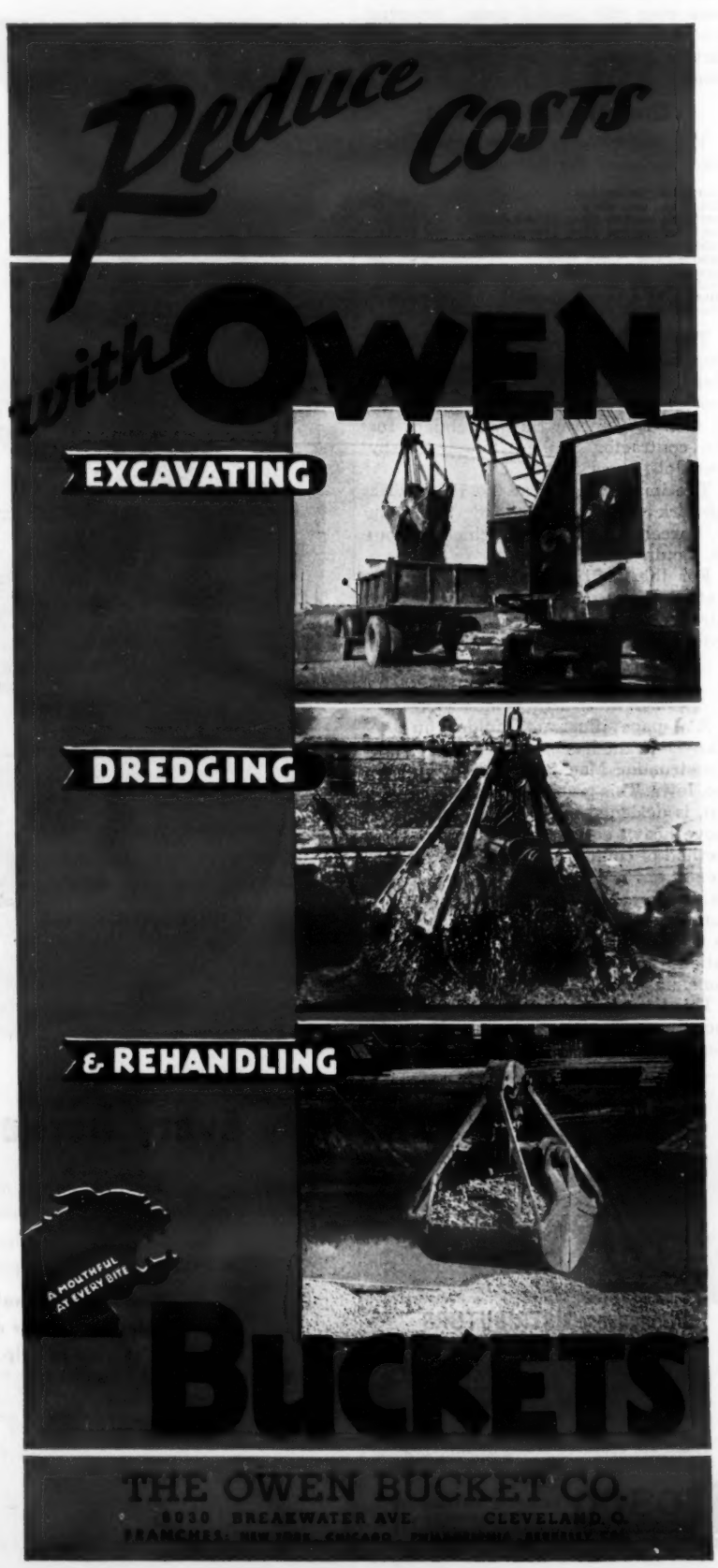
FILL-A-MATIC REFUELING IS SIMPLE no tools required

1 Remove fuel tank cap
2 Place FILL-A-MATIC cap and hose on tank
3 Idle engine and place hose in fuel container
4 OPEN valve in copper line, suction of engine will then create vacuum in fuel tank until float valve shuts off suction indicating tank is full
5 Replace FILL-A-MATIC cap with regular cap and CLOSE shut-off valve in copper line

Write for prices and further information. See FILL-A-MATIC at the A. E. D. Chicago Jan. 15th-19th. J. A. Wente Rep. Palmer House

THE FILL-A-MATIC CO.

817 West Market St., Louisville 2, Ky.



New Hampshire Got Breather Last Winter

Lightest Snowfall in Ten Years, But Ice Prevention Kept Forces Busy Spreading Chloride

✦ THE winter maintenance report of the New Hampshire State Highway Department reveals that the 1948-1949 winter was unusually mild when compared with averages of the past ten winters. The total average 54.8-inch snowfall for the state was 29.4 inches below the average of the past ten winters, and 42.8 inches below that of the previous winter. October was the only month to show an excess of snowfall, being 0.8 inch above the average. Its monthly temperature average was below normal by 0.1 degree. The other months from November through April had temperatures well above the norm.

Last winter the State spent $1,203,788.34 for the winter maintenance of 3,149.77 miles of the state highway system, at a cost per mile of $382.18. The total mileage was divided nearly equally between primary and secondary roads, there being 1,552.80 and 1,596.97 miles of each class respectively. Of the various items involved in winter maintenance, the largest expenditure was for chlorides employed in ice prevention. The second largest item was for snow plowing.

The division of items in winter maintenance with the total expenditure on each was as follows:

Chlorides for ice prevention	$ 359,200.67
Plowing	356,543.05
Sanding	196,538.21
Spreading chlorides	156,283.93
Snow fence	70,402.09
Night weather patrol	45,305.22
Chlorides for sand	19,515.17
Total	$1,203,788.34

Equipment and Materials

On this work the State used 47 of its own trucks and 298 hired trucks for a total of 345. Of the state-owned trucks, 6 were in the 2 to 2½-ton size, 27 were in the 3 to 4-ton size, while the remaining 14 were vehicles of 5 tons or over. The hired trucks were lighter, with the majority under 2½ tons. Seven motor graders were also in service. Plows numbered 356, and comprised 314 one-way spinners; 24 reversible type; and 18 V-type plows. There were also 291 wings in use, and 288 sand spreaders.

New Hampshire Highway Department Photo
New Hampshire applies salt for ice prevention by means of spreaders with a telescoping pipe at the bottom. The end of the pipe is held 6 to 12 inches above the highway.

On the material side the State required 37,575 cubic yards of sand; 19,285 tons of sodium chloride; and 164 tons of calcium chloride. To keep the snow from drifting over the highways, 1,036,699 linear feet of snow fence was erected. Reports from the night weather patrol show that they rendered assistance to 249 motorists during the course of the winter. Of this number 200 were from New Hampshire and 49 from out of state.

In the use of salt for ice prevention, the salt was applied down the middle of the plowed road at the rate of 300 pounds per mile for a 20-foot pavement. Salt spreaders with a telescoping pipe at the bottom were used, the end of the pipe being held from 6 to 12 inches above the ground. The salt brine runs off to the edges of the pavement, melting the snow and ice as it goes.

L. F. Johnson is Maintenance Engineer for the New Hampshire Highway Department, with headquarters at Concord.

Marion Engineer Dies

Glenn B. Heffelfinger, Assistant Chief Engineer in charge of large-shovel design for Marion Power Shovel Co., Marion, Ohio, died recently of a heart attack. He had been associated with the company for over 25 years and had played a key role in developing the Marion "knee-action" front end for shovels and the "swivel" walking device for draglines.

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No heat, acids or complicated equipment required for installation. Ordinary mechanic's tools do the job, safely, even in chemical plants, powder plants and mines, where other methods would be prohibited. And they are safe to use, because they have the highest holding strength of any known wire rope or strand connectors. They assure *savings in installation* because unskilled labor can do the job easily and quickly; *savings in use* because they prolong wire rope life by damping vibration and overcoming rope fatigue at entrance to fitting . . . and because they are reclaimable.

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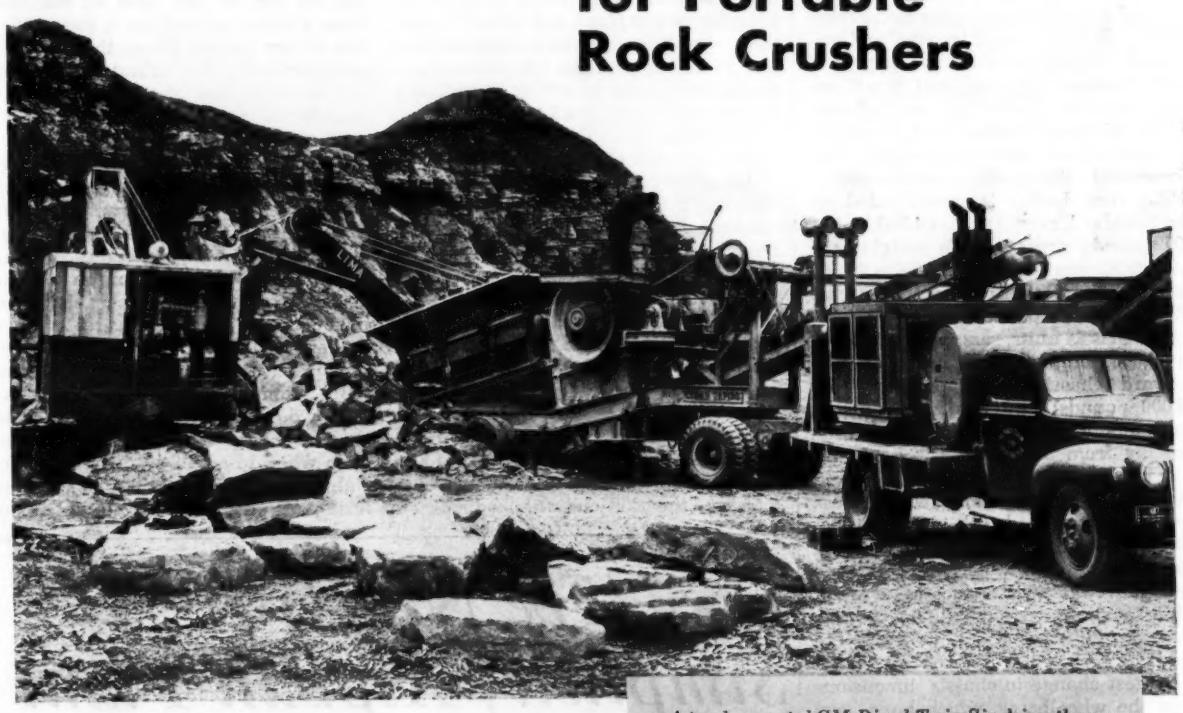

A truck-mounted GM Diesel Twin Six drives the 40" hammermill, a single six powers the 20" x 36" jaw crusher on this Cedar Rapids portable unit, one of two GM Diesel-powered plants operated by B. L. Anderson in eastern Iowa. Each plant averages 130 tons of ¾" road rock per hour. Operating 18 GM Diesel engines in various pieces of equipment, Anderson has lost only one day's operation in three years due to engine failure.

THAT'S what hundreds of operators like B. L. Anderson of Cedar Rapids, Iowa, are saying about General Motors Series 71 Diesels—and with good reasons.

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GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

New features and improvements are incorporated in International Harvester's new Loadstar truck Model L-194, one of 87 new L-line basic truck-chassis models recently introduced. It has been a gross vehicle weight rating of 25,500 pounds.

A New and Improved Truck Line Offered

A completely re-designed and re-engineered line of heavy-duty International trucks has been announced by the Motor Truck Division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. The new L-line consists of 87 separate truck-chassis models. It features a cab designed to provide more room and greater visibility; chassis dimensions that permit better load distribution, greater maneuverability, shorter overall lengths, and improved engine accessibility; improved valve-in-head International truck series engines, including an all-new Silver Diamond engine; and a number of mechanical and engineering improvements designed to reduce cost.

The new L-line is spearheaded by the Standard, ranging from 4,200 to 40,000 pounds gross vehicle weight; the Loadstar, ranging from 16,500 to 29,500 pounds; the Roadliner, ranging from 16,000 to 30,000 pounds; a group of six-wheel chassis units, ranging from 22,000 to 50,000 pounds; a new group of cab-forward chassis units, ranging from 14,000 pounds; and two highway and four off-highway West Coast trucks ranging from 30,000 to 90,000 pounds.

A large one-piece windshield, curved to minimize eyestrain and reduce glare, gives unobstructed full front vision. Not only has the windshield center post been eliminated, but corner posts have been moved back to reduce blind spots, while a shorter front-axle-to-cab dimension gives a closer view of the road.

Biggest change in chassis dimensions is in the wheelbases, which have been shortened as much as 7 inches in some models. The shorter wheelbases, together with re-proportioned cab-to-rear-axle dimensions and front-axle-to-cab dimensions, have resulted in a shifting of load weight so that it is in balance between front and rear axles. Better maneuverability results from the shorter turning radius of the shorter wheelbases, as well as from the widened axle treads. The turning angle on practically all models throughout the line has been increased to a minimum of 37 degrees, for both popular and standard tire sizes.

The new Silver Diamond engine, used in the company's light and medium-duty trucks, is a valve-in-head 6-cylinder power plant and is built in two sizes—the 220-cubic-inch-displacement size at 100 hp and the 240-cubic-inch-displacement size at 108 hp. Each has a compression ratio of 6.5 to 1.

The Super Blue Diamond engine has a displacement of 269 cubic inches and a horsepower of 100.5. Compression ratio is 6.3 to 1. In addition to features retained from the Blue Diamond, the Super Blue Diamond has added engineering refinements including: Stellite-faced valves; Durachrome heat-treated valve inserts; a more efficient crankcase ventilating system; an improved lubrication system; and deep-well tappet fittings.

The Super Red Diamond engine is available in three sizes. The 372-cubic-inch-displacement size develops 144 hp; the 406-cubic-inch-displacement size, 154 hp; the 450-cubic-inch-displacement size, 162 hp. Compression ratio of the Super Red Diamond is 6.3 to 1. Main transmissions available include two sizes of 3-speed Synchro-shift; a 4-speed sliding gear; a new 4-speed Synchro-shift; four sizes of heavy-duty 5-speed constant-mesh, with direct or overdrive in fifth; and 5-speed Synchro-shift, with direct or overdrive in fifth. A number of auxiliary transmissions also are available.

In International's Steel-flex frame construction, strength has been combined with flexibility to provide a frame that stands up under heavy loads and rough roads. Sturdy cross-members—five in light trucks, six in mediums, and seven in heavies—are cold-riveted to the deep pressed-steel channel side rails. A heavy channel-type bumper, forming an extra frame cross-member, is mounted directly to the frame for added strength and rigidity.

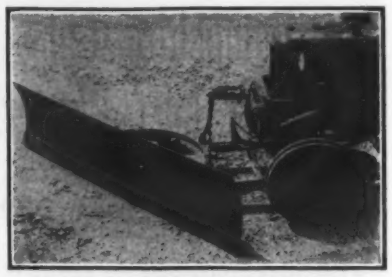
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 93.

New Angling Dozer Has Hydraulic Lift

A new hydraulic-lift angle bulldozer has been added to its line by Ottawa Steel Products, Inc., Ottawa, Kansas. It is designed for use with small industrial tractors such as the Allis-Chalmers Model IB in small grading and backfilling jobs.

One of the features of the new angle bulldozer is that it can be mounted on the IB tractor and used at the same time a mowing machine is mounted. If the owner desires to use the mower, it requires but a few minutes to remove the main portion of the angledozer to permit the mower to operate.

The tractor's hydraulic system is utilized to raise and lower the angle bulldozer when clearing high curbs, etc. The blade has 9 different positions, starting from a full 40-degree angle right, to lesser angle degrees, up to a straight bulldozer position, on to a full 40 degrees left. The replaceable cutting edge on the blade is protected from damage from immovable obstructions by means of a spring trip mechanism with automatic return. The blade is 7 feet wide and will clear a path wider than the rear wheels of the tractor, even when in a full 40-degree position right or left. The blade also has a semi-float position to allow for slight undulations on streets or driveways. Another feature of the angledozer is a side-draft minimizer which prevents swinging of the plow and supporting thrust arms, while in action.



The Ottawa hydraulic-lift angle bulldozer is for use with small tractors such as the Allis-Chalmers IB on small grading and backfilling jobs.

Further information may be secured direct from the company, or by using the Request Card bound in at page 16. Circle No. 31.

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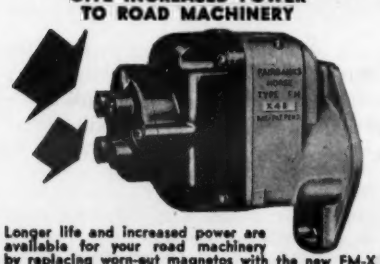

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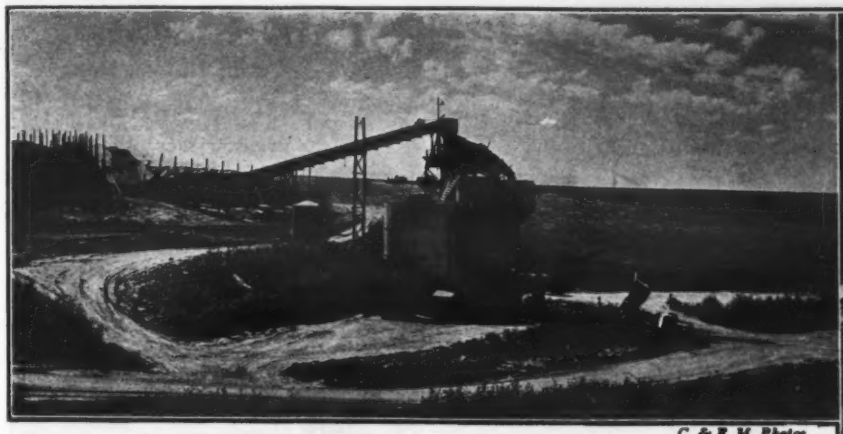

C. & E. M. Photos

The Noble plant above, with a Dumpcrete truck in front of it, is batching out spillway concrete for Medicine Creek Dam. The general view of the spillway at the right shows the concrete work partly complete and the low flood insurance block in the foreground.

Dumpcretes Haul Concrete for Dam

Medicine Creek Spillway and Outlet Works Placed by Cranes After Trucks Hauled Concrete to Site

(Photo on page 1)

✦ FOUR Dumpcrete bodies, mounted on Ford trucks, speeded the construction of the reinforced-concrete spillway and outlet structures at Medicine Creek Dam, near Cambridge, Nebr. (See C. & E. M., Dec., 1949, pg. 20.) Owned by Lytle & Amis, contractor on the $5,115,000 structure for the U. S. Bureau of Reclamation, the four machines successfully transported about 30,000 cubic yards of concrete between the batch plant and the dam, a distance of 1,200 feet.

And as if that were not enough, another Dumpcrete—this time one which had been revamped and fitted with a covered top—transported all the cement to mix that concrete. It was somewhat of a feat, because the cement came in to a railroad siding near Cambridge, where it was unloaded, and then had to be hauled 9 miles one way to the Noble batch plant at the dam.

C. L. Dye, young driver of the Ford truck, knew perhaps better than anyone else the importance and extent of his job.

"The batch plant used plenty of cement," he said. "Sometimes I worked 16 hours a day when they were pouring at top speed. On this 9-mile haul I could get a trip an hour."

That meant overtime pay, though, along with plenty of exercise when Dye beat hell out of the cement storage silo with a heavy hammer to make the cement run down. The drive over a gravel road which led to the dam was not child's play, either. Commenting on his troubles at the railroad siding, the good-natured youngster grinned and said, "This cement is the only thing I've found that wouldn't fall when you dropped it!"

Cement Shipped In

Bulk cement for the concrete mix was shipped in from the Ideal Cement Co. manufacturing plant, over the Burlington railroad, from Superior, Nebr. A low-alkali Type II material was used. It came in loaded in hopper-bottom cars, at a peak rate of about 7 carloads a week. The cars were spotted on the siding over a screw-feed conveyor, which hoisted the cement to a 400-barrel storage silo. A downspout and a manually operated gate permitted the Dumpcrete body to load as it stood on

(Continued on next page)

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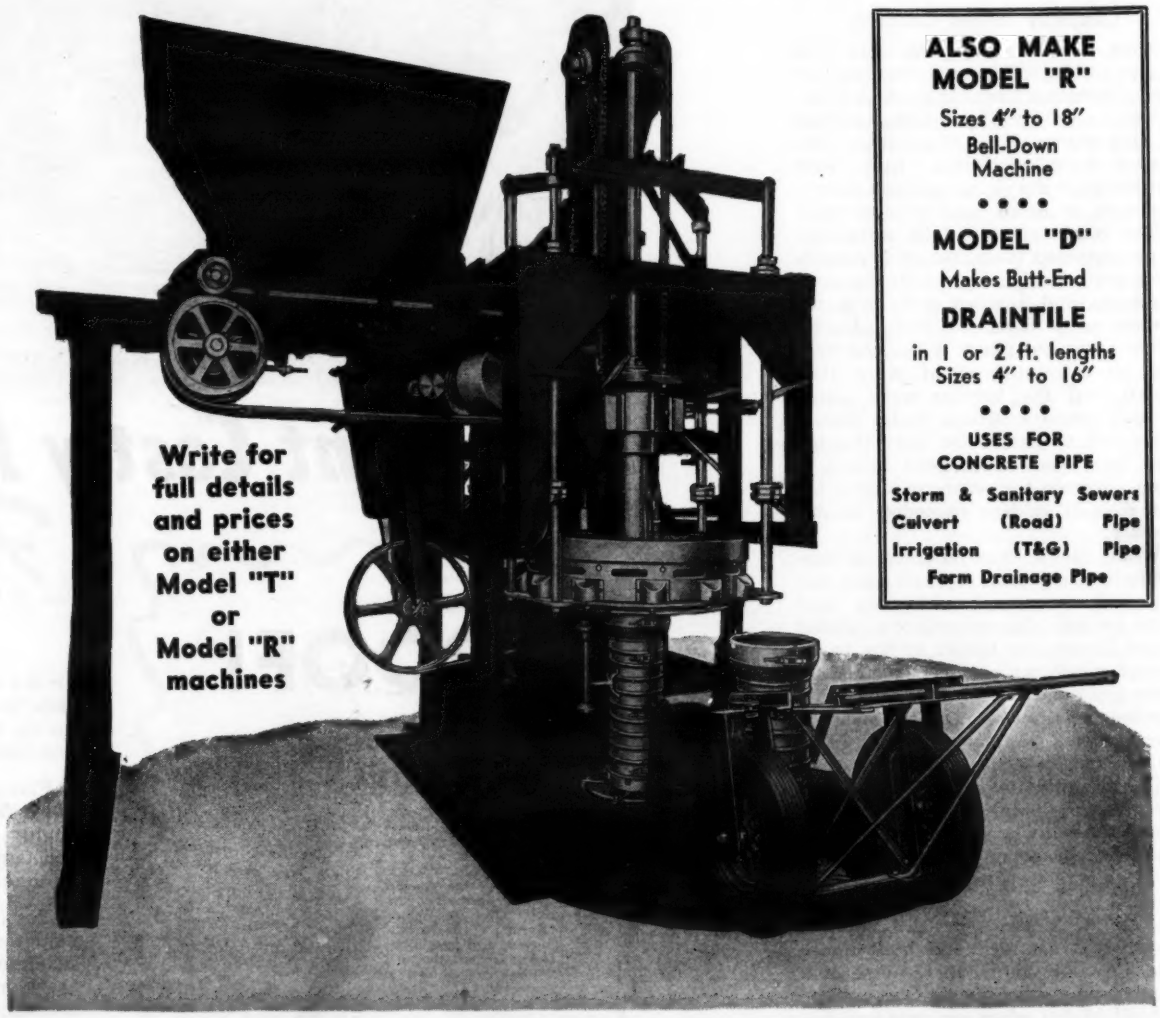

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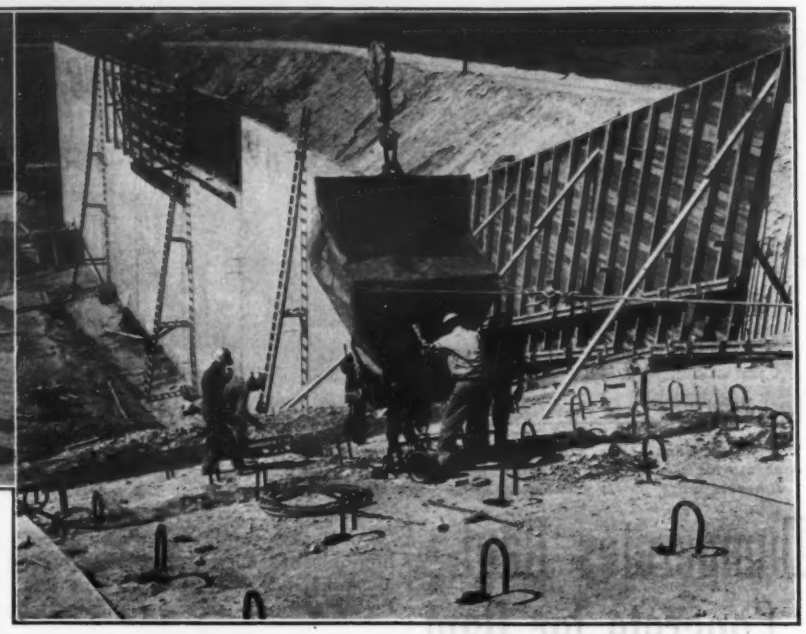

C. & E. M. Photos

A Dumpcrete body dumps its 2½-cubic-yard load of concrete to a Gar-Bro bucket (above) which is then swung by a placing crane to a spillway slab (right) of Medicine Creek Dam.

Dumpcretes Haul Concrete for Dam

(*Continued from preceding page*)

a haul road beneath the silo.

About 30 barrels of cement could be hauled at one trip. The Ford truck hauled on a smooth, all-weather gravel road which leads out to the dam.

At the dam, the truck pulled in to the Noble 350-ton concrete batching plant, and unloaded the cement into an open hopper at ground level. A screw-feed conveyor stored the material in the plant silo temporarily, until it was needed in the batches.

Centrally Mixed Concrete

Sand for the concrete mix was shipped in by rail from Graveldale, and rock aggregates from Big Springs. Commercial suppliers of concrete materials at these places on the Platte River produced these materials. They were stockpiled at the plant, and moved from stockpile to batch bins by conveyors.

The Noble plant is fully automatic. It proportioned the materials in accordance with the Bureau of Reclamation formulae, and dumped them with the cement to a Ransome 34-E concrete paver under the plant. Water and Protex air-entraining agent were then added, and the batches were mixed about 2 minutes. Mixing water from a deep well, carried to the plant through pipe lines below frost level, helped to keep concrete temperatures down. On hot days it seldom exceeded 70 degrees F.

While the 4 Ford-mounted Dumpcretes have a greater capacity, only two 1¼-yard concrete batches per load were hauled. The concrete was placed in the Dumpcrete bodies by the paver bucket, which ran out over its standard boom until it was over the Dumpcrete. Limited maneuvering space made it necessary for the trucks to back in to get their load.

The concrete, mixed out to an average 1½-inch slump, stood the 1,200-foot trip to the spillway section without any apparent segregation of particles. When the Dumpcretes got to the dam, they dumped their loads to the concrete buckets. A standard Gar-Bro laydown bucket was enlarged and built up to take 2½ cubic yards. In the case of a massive pour, the bucket was practically filled, but when concrete was being placed in some of the thin, tricky walls and bridge piers, the transfer buckets were never loaded that heavily.

Placing cranes consisted of a Bucyrus-Erie 54-B with a 100-foot boom, and a Koehring 605 with a 60-foot boom. A Lorain Moto-Crane was also around to handle occasional small concrete pours, but it saw most of its service on the setting of steel reinforcement, stripping of forms, and the other miscellaneous but important jobs that make up construction of a dam spillway.

As a rule, one 10-hour placing shift each day kept concrete up with the form setters. Concrete was brought up level all the way across the form—"taking it

(*Concluded on next page*)

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Meets the fire resistant requirements of Federal Specifications CCC-D-746.

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BY THE BLOW TORCH TEST

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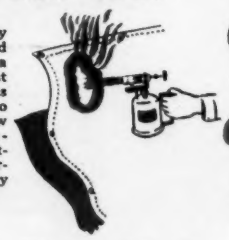

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Yes . . . now you can leave the job knowing that your tarps won't kindle costly fires when exposed to salamanders, glowing cigarettes, sparks, hot rivets, acetylene torches, etc. Protect your construction investment NOW!

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slow" in the cases of top forms high in the air. Viber electric vibrators were used, getting their power from the two Caterpillar D17000 generating sets on top of the hill.

Original specifications called for a hard steel-troweled finish on the spillway slabs, but permission was obtained to use an ordinary smooth wood-float finish instead. It can hardly be told from the original design. The careful manner in which the concrete was placed insured against spreading forms, bulges, and the like. Heavy vibration, plus the use of air-entraining Protex, has also done away with rock pockets, the bane of concrete-placing crews.

Masonite-Lined Forms

The exposed spillway concrete was formed almost to architectural standards. Very few of the pours were so similar that the forms could be re-used, so a large carpenter crew worked full time on the many panels required.

Unexposed faces were formed with ordinary surfaced shiplap lumber, but the exposed places got Masonite lining. This was nailed on, butting the joints just right and driving the nails just even with the surface of the Masonite. The forms were manufactured according to plan in a large central yard near the left abutment, where power saws were located. The completed panels were loaded to a flat-rack truck by the Lorain Moto-Crane, trucked out to the spillway, and there set by a crane.

Insofar as possible, form lumber was salvaged and re-used if it was not damaged. The concrete was cured by Sealtex concrete-curing solution as soon as the forms were stripped. The white-pigmented material was also sprayed on the open faces of slabs.

Medicine Creek Dam is being constructed for the dual purpose of flood control and irrigation, and the concrete work described will handle all the outflow of water from the maximum 150,000-acre-foot reservoir. The C. F. Lytle Co. and Amis Construction Co. completed the concrete work by December 15, 1949.

The new Clement 500 dump trailer is designed to dump at an angle without danger of overturning or twisting the support arms.

New Cable-Operated Dump Trailer Offered

The new Clement 500 dump trailer, which is said to embody features that will allow it to dump at an angle without danger of overturning or twisting the support arms, is now offered by Winch-Lift, Inc., First National Bank Bldg., Shreveport, La. This cable-operated trailer can be maneuvered into a jack-knife position or can spread-dump or spot-dump at an angle of approximately 60 degrees, according to the manufacturer.

The Clement trailers are made in capacities of 8 to 24 cubic yards, with single and tandem axles. The winch, cable, and lift arms are designed to eliminate heavy subframes and thereby reduce the total dead weight. Standard on all Clements is a self-loading fifth wheel. However, the trailer may be mounted on a conventional "stud" fifth wheel by blocking the wheel up to prevent movement. The block may be removed so that the same tractor and fifth wheel may be used to haul other types of trailers.

An automatic tail-gate latch is standard equipment. As soon as the body begins to rise, the tail-gate latch automatically releases, to start dumping the load; it automatically locks when the body is lowered. Manual latches are also available. The 14 and 16-foot trailers use a 12,000-pound winch with a ⅝-inch 6 x 19 steel-center Lang-lay preformed cable. The 18 and 23-foot trailers use a 25,000-pound winch with a ¾-inch 6 x 19 steel-center Lang-lay preformed cable. A 1-to-1 power take-off, one speed forward and one reverse, is used on all winch installations. The single control lever is in the cab. The winch should be mounted directly on the tractor frame so that the top of the winch is in line with fair-lead sheaves on the Clement upper fifth wheel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 109.

Hoisting-Tower Details

A full description of Beaver hoisting towers is given in a new folder just issued by the Dravo Corp., National Department, Dravo Building, Pittsburgh, Pa. These hoist towers are manufactured by the Beaver Art Metal Corp., of Ellwood City, Pa., and distributed by Dravo.

The catalog explains that two types of towers are standard in the Beaver line: the heavy-duty type, made to a height of 1,200 feet, has a live-load capacity of 5,000 pounds; the light-duty type, made to a height of 200 feet, has a live-load capacity of 3,200 pounds.

This literature may be obtained from Dravo, or by using the Request Card at page 16. Circle No. 10.

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TARPAULINS

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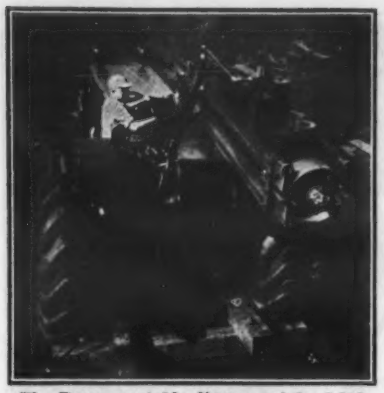

The Roper portable digger weighs 2,200 pounds and will dig holes 6½ feet deep and 14 inches wide in any type of soil.

New Portable Digger For Stubborn Ground

A 2,200-pound posthole digger designed to dig holes 6½ feet deep and 14 inches wide in any type of soil has been manufactured for the U. S. Army by the Roper Mfg. Co. of Zanesville, Ohio.

The new digger is powered by a 125-hp diesel tractor, from a power take-off in the rear. The operator can remain in his seat, dig the hole, and lay the digger back on the tractor into its traveling position. The unit will dig at any angle and has double hydraulic cylinders for all angular adjustments.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 66.

Anchoring and Drilling Devices for Fastenings

A 48-page catalog on masonry anchoring and drilling devices is available from Star Expansion Bolt Co., Inc., 147 Cedar St., New York 6, N. Y. Illustrations, sizes, prices, and descriptions are given for fasteners of the machine bolt, lag, and wood screw types; and for nail anchors, chair shields, bolts for hollow tile, drilling devices, and fittings and extractor accessories. The folder explains that the working loads listed are dependent upon correct installation in good-quality masonry and allow a standard factor of safety. They are based upon an average of many physical tests.

This literature may be obtained from the company, or use the Request Card at page 16. Circle No. 73.

New Asphalt Mixer

A new asphalt mixer designed for a 1-ton capacity per minute, the JR Multi-Pug mixer, has been announced by K. E. McConnaughay, West Lafayette, Ind. It weighs 1,200 pounds and can be moved by one man on its two pneumatic-tired wheels. Power is supplied by a 2-cylinder 14-hp Wisconsin air-cooled engine with clutch. The asphalt pump has a 20-gpm rated capacity and is of the positive-displacement type.

This mixer, the company says, can be used to combine aggregates with emulsified asphalt, cut-back asphalt, and tar; and if the aggregate is dried and heated, hot asphalt may be used. As a stationary plant, the mixer can be set up at either end of a portable belt conveyor, or can be mounted on a bin or at the discharge end of a bucket-type loader. The machine can be adapted for use as a mix-spread unit, with the aggregate and asphalt fed and proportioned from the dump truck into the mixer and discharged on the road surface.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 49.

New Blaw-Knox Building

The Blaw-Knox Co. of Pittsburgh, Pa., has constructed a new $500,000 administration building for its largest manufacturing division located at Blawnox, Pa. The structural frame of the building is a precast concrete, Cemenstone. The upper three floors, which are faced with brick on tile, provide space for offices and drafting rooms. The concreted basement has a print shop, conference rooms, and storage space.

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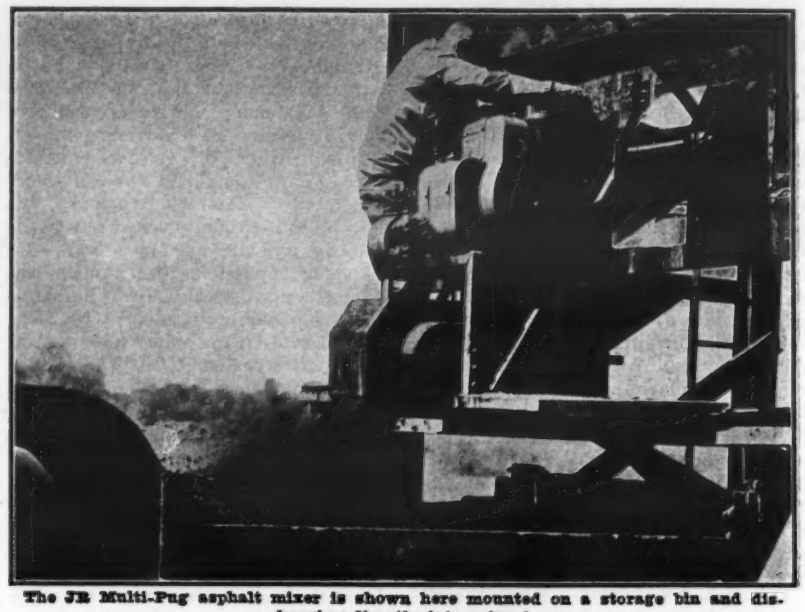
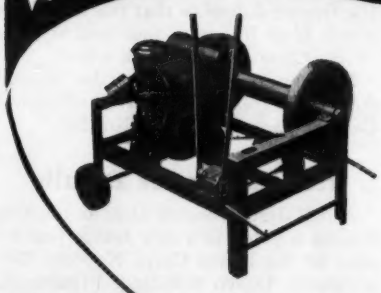
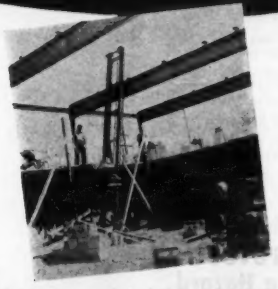


The JR Multi-Pug asphalt mixer is shown here mounted on a storage bin and discharging directly into a truck.

Unbeatable Combination!
★KING PORTABLE HOISTS plus KING INCLINE TRACK





The handiest hoist ever built—no trick to operate, just 2 levers—rugged—easy to move — simple to anchor — 7 different models. Safely hoist all building materials as construction progresses. Ample power—air cooled motors—use minimum fuel, even operating continuously. No maintenance except upkeep on the engine. You build the pine lumber track and platform floor — we furnish structural steel carrier and hoisting wheels with assembly plans. Double line pull for easy hoisting—up to 1,000 lbs. Designed for use with King Hoists or any high speed hoist with 400 lb. single line pull. Elevate wheelbarrows, blocks, bricks, roofing to as high as five stories. WRITE FOR DESCRIPTIVE LITERATURE or See Your Distributor.

ALSO Electric Powered Winches, Hoisting Wheels, Safety Hooks

KING MANUFACTURING CORPORATION
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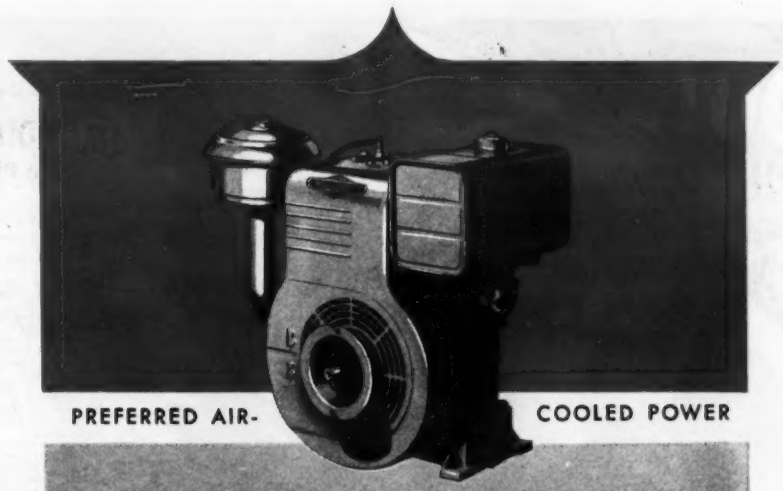

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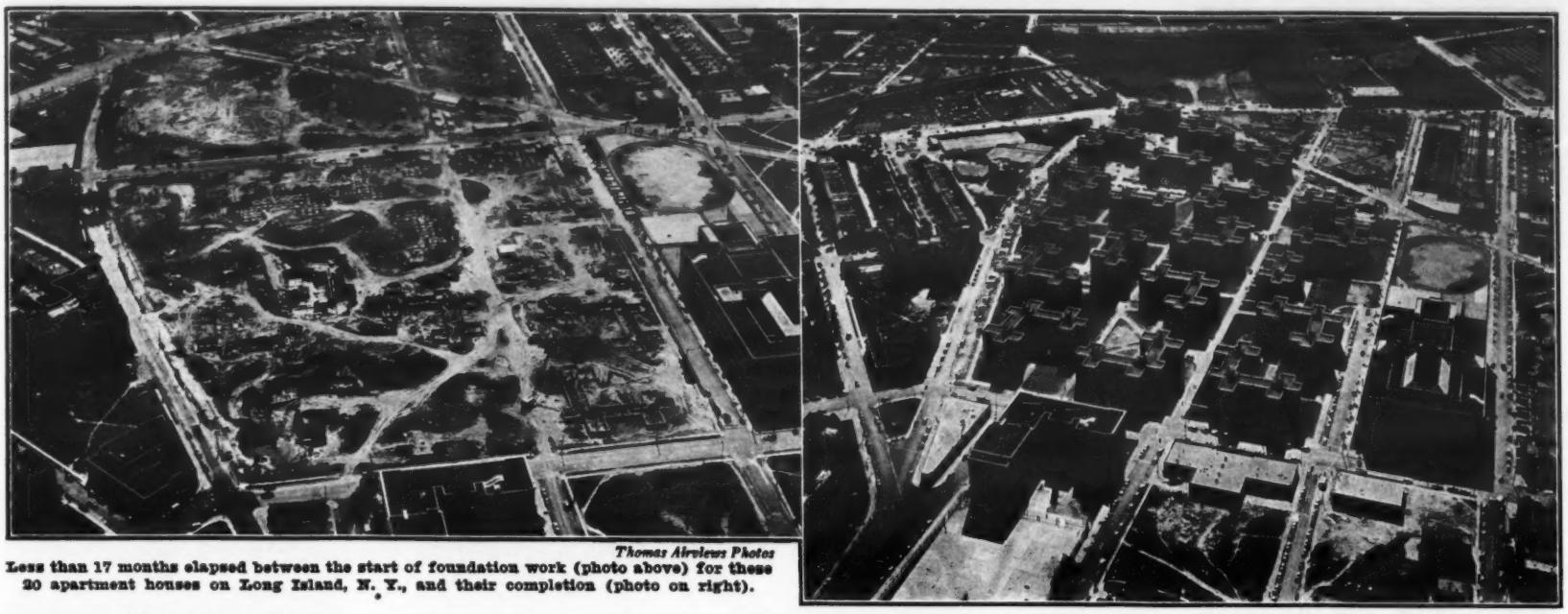
Milwaukee 1, Wisconsin, U. S. A.

4 CYCLE BRIGGS & STRATTON GASOLINE ENGINES
Preferred Power FOR INDUSTRIAL CONSTRUCTION RAILROAD AND FARM EQUIPMENT



Thomas Airviews Photos

Less than 17 months elapsed between the start of foundation work (photo above) for these 20 apartment houses on Long Island, N. Y., and their completion (photo on right).

Twenty Housing Units Built in 17 Months

Twenty 6-story reinforced-concrete apartment houses at Woodside, Long Island, N. Y., were completed November 21—17 months after the ground was broken for the first building and 3 months ahead of schedule. The George F. Driscoll Co. and Moccia Construction Corp. did the work for the New York City Housing Authority at a cost of $10,812,409 or $1,917 per room for 5,640 rooms.

In 98 working days, the contractors placed the 140 floors of the Woodside Houses; the 1,200,000 square feet of floor area contained 34,000 cubic yards of concrete. Except for metal column forms, plastic-coated plywood forms were used throughout. And all the concrete was placed by crane, with Insley 1½-yard buckets.

The 20 buildings cover 18.8 per cent of a 22-acre landscaped site at Newton Road and 49th Street in Woodside. They provide housing for 5,091 persons in 1,357 one to five-room apartments. Their rapid completion marks one of the best records established on Housing Authority projects, according to Fred J. Driscoll, President of the Driscoll Co., and was possible through the close cooperation of subcontractors and high efficiency of the building craftsmen.

Wood-Protection Methods

A 6-page bulletin featuring the protection of wood from insect attack has recently been prepared by the Chapman Chemical Co., 770 Dermon Bldg., Memphis 3, Tenn., manufacturer of Penta and other wood preservatives. This bulletin, T-49, is printed in two colors and with both pictures and drawings to point up the textual matter. Termite habits and signs of termite infestation are explained. The bulletin then presents directions for preventing termite attack, and explains how to save wood already infested. Powder-post beetles and dry-wood termites and their control are also discussed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 91.

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Cut Your Costs On Every Type Of Construction Job...With BLUE BRUTES!

Here are typical examples of the up-to-the-minute design, long-lasting construction and smooth, dependable performance now proving to contractors all over the world that there's more worth in a Blue Brute. Your nearby Worthington-Ransome Dealer has the complete line of Blue Brute Construction Equipment. Write for his name.

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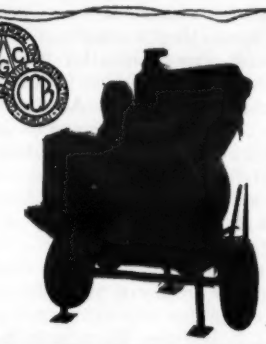
BUY BLUE BRUTES

Concrete Costs Less!

Count on Blue Brute Portable Mixers for lower-cost concrete on every job. Quickly spotted and towed, and with such features as smooth, positive gear-and-pinion drive . . . high-carbon, Timken-equipped drum rollers . . . and Ransome's famous mixing action, they're sure bets for speedier, better mixing.



Water-Handling Cheaper!

You'll move *more* water — faster, farther, easier with a Blue Brute Self-Priming Centrifugal Pump. Rugged in every detail, with fast pickup, extra reserve power and high resistance to rust, corrosion and ordinary wear. Built in A.G.C. sizes to A.G.C. standards.

More Air For Less Money!

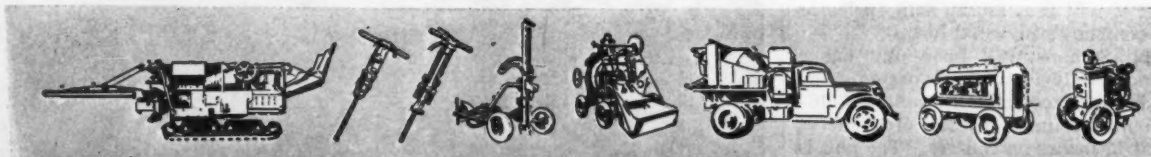
Get *all* the air-power out of every drop of fuel with a Blue Brute 60′ Portable Air Compressor. Strong, light and efficient, it provides constant, dependable, economical air supply through its easy-breathing Worthington Feather* Valves. Other Blue Brute Compressors, from 105′ to 500′.

*REG. U.S. PAT. OFF.

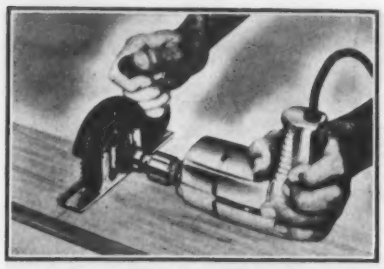
Construction Expenses at Rock Bottom!

Team up these fast, hard-hitting Blue Brute Air Tools with Blue Brute Compressors — and watch your daily expenses go down. Though tough and powerful, they have the lightness and compactness to keep your workers more satisfied—and more productive.

H9-3



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB



The Zip Sawer Jr. uses any ¼-inch electric drill for power.

Portable Power Saw Driven From a Drill

A new portable power saw that uses any ¼-inch electric drill for power has just been announced by Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill. One end of the saw arbor has a ¼-inch shank that fits into the drill chuck. Its light weight and small size make it useful for trimming, rip and cross-cut sawing, and dado cutting up to its rated capacity.

Called the Zip Sawer Jr., this portable power saw is driven directly from the electric drill; there are no gears or other connecting mechanism. A one-piece, cast aluminum-alloy frame contains the saw blade guard, bearing for saw arbor, and handle. An aluminum, adjustable plate shoe fastens to the side of the frame. The saw is indexed for straight-line cutting. Both sides of the plate are machined to enable use against a guide for long rip or dado cutting.

The saw is furnished with a combination rip and cross-cut blade 4 inches in diameter, giving a maximum depth of cut of 1 inch. Other blades can be substituted for other cutting. The weight of the unit is 1½ pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 59.

Revolving Signal For Added Safety

A new eight-sided wind-rotated sign, the Roto-Signal, is announced by Roto-Signal, Inc., Brecksville, Ohio. The signal stands 52 inches high and has slightly curved faces designed to trap the slightest breath of air. This moving signal, the company says, will catch the eye faster and better than stationary signs, and will allow 100 percent visibility and readability whether spinning fast or slow.

The sign may be lettered "Men at Work", "Caution", or any other desired wording. It is 15 x 24 inches in size, and is reflectorized and treated with a rust-inhibiting coating. The all-steel spinning mechanism has vanadium-steel ball bearings and is designed for constant action. The Roto-Signal, the company says, stands up to winds of gale velocity without falling. The signal may be taken apart and folded for transportation or storage.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 46.

New Magnesium Forms

Concrete wall forms made of lightweight magnesium are the latest advancement offered to the construction industry by the Symons Clamp & Mfg. Co., 4251 Diversey Ave., Chicago 39, Ill. The company points out that a form panel weighs less than 3 pounds per square foot; it will not swell when wet nor contract when dry; it will not rust; it will rent at the same price as the company's plywood forms.

The Symons wall form unit has a facing of 3/16-inch Z1 magnesium alloy welded to a rectangular frame of 5/16-inch magnesium FS alloy cross-pieces set at 12 inches on centers. The unit is Heliarc-welded and annealed to relieve welding stresses. Panel sizes available are 2 x 4, 2 x 6, and 2 x 8 feet. The units are connected with flat steel connecting bolts. The two walls forming the pouring space are held in alignment with the Symons slip wale tie. The wale which holds the entire wall unit in line consists of two 2 x 4's held in place by U-plates, wale ties, and tightening wedges.

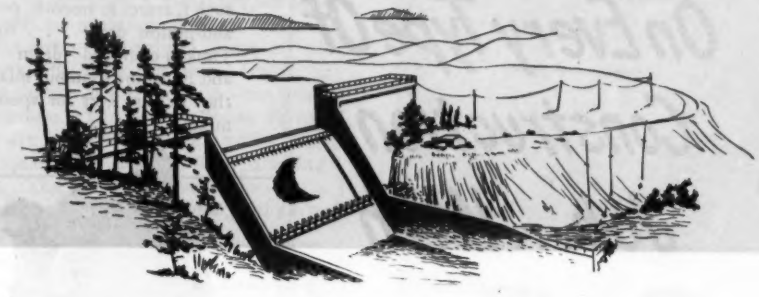
In addition to the wall form units, the Symons system includes magnesium inside and outside corner sections and filler frames cut from extruded 5/16-inch magnesium FS alloy. Symons also manufactures a combination form, utilizing the magnesium frame with a plywood facing. This weighs approximately 4 pounds per square foot.

These new forms will be on display at the January meetings of the Associated Equipment Distributors, the National Sand & Gravel Association, and the Ready-Mixed Concrete Association.

The new Symons magnesium forms weigh less than 3 pounds per square foot. They will not swell when wet, contract when dry, or rust, says the company.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 140.

Ahead of Schedule



with equipment that's ahead in performance

DORENA DAM, Oregon, begun in May, 1947, was considered a big 3½-year project. Good organization* plus job-steady "Cat" DW10s were two important reasons why completion time was shortened by almost 12 months.

Ten DW10 Tractors with No. 10 Scrapers spearheaded the "Caterpillar" fleet. Extended sides on the Scrapers enabled each to carry 11 borrow-pit yards. Averaging about 6 trips each on hauls over 4000 feet . . . including 1500 feet of adverse grade to crest of dam . . . these units moved some 570 cubic yards per hour—for a total of about 10,250 yards per 18-hour day. Two D8s served as pushing units in the pits . . . loading time less than a minute. Four additional DW10s worked on the fill, equipped with 'dozers and pneumatic-tired tampers.

These records tell a story of speed, volume—and owner-operator satisfaction. Project Manager A. H. Steiner says: "These units are unbeatable. Among their biggest features are their easy loading and ease of operation. Our boys work 9 hours a day and hardly know when lunch hour comes around."

Profit-making speed and volume, little or no interrupting down time over long periods of operation, complete satisfaction—are the "end results" "Caterpillar" owners expect and invariably *get*.

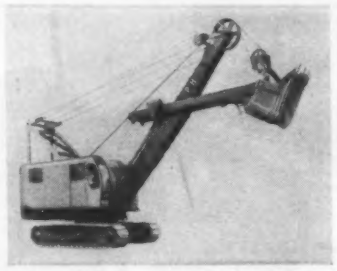
CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

** Under the name of The Dorena Construction Co., this project was put through with the co-ordinated facilities of: G. F. Atkinson Co., Bressi & Bevanda Construction, Inc., W. E. Kier Construction Co., and A. Teichert & Son, Inc.*

New Electric Swing On 2½-Yard Shovel

Another shovel with Magnetorque electric swing has been added to the P&H line of excavators manufactured by the Harnischfeger Corp., Large Excavator Division, 4400 W. National Ave., Milwaukee 14, Wis. The Model 955-A has a capacity of 2½ yards as a shovel and 3 yards as a dragline.

Features claimed for the electromagnetic type of swing mechanism are these: all friction on swing and propel motions is eliminated; swinging is more responsive; starts and stops are more accurate and faster; and maintenance costs are reduced. The unit is made from rolled alloy steels and is of all-welded construction. It has simplified



Another P&H shovel with Magnetorque electric swing is in production—the 2½-yard Model 955-A.

heavy-duty hydraulic control of the automotive type, and it can be converted to shovel, dragline, crane, and clamshell operation.

Further information may be secured from the company. Or by using the Request Card at page 16. Circle No. 1.

Wax for Snow Plows

Development of an improved grade of Penn Drake snow-plow wax is announced by Pennsylvania Refining Co., Cleveland 4, Ohio. Applied with either paint brush or spray gun, the new wax is designed to provide a heavy and long-lasting coat for the working surfaces of snow-removal equipment. It is said to be 50 per cent thicker than the Penn Drake wax formerly provided, with correspondingly longer service life.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 17.

Here the Brick-Lay-R, unclamped, is being shifted to the next work area.

New Machine Reduces Cost of Bricklaying

The mechanical principles of the new Brick-Lay-R remove the need for long training in the art of masonry, yet serve the skilled worker by increasing his efficiency, according to an announcement by Hodgson-Sommers, Inc., Montgomery, Ala. The machine, more properly called a jig or device, does not lay bricks automatically. It makes greater speed possible through the elimination of many standard operations. The company claims that the Brick-Lay-R will enable unskilled labor to lay 3,000 bricks per day in 12-inch walls or 2,000 bricks per day in 8-inch walls.

Built-in spirit levels at the sides and ends check constant plumb, eliminating the need for plumb lines, string wall guides, and the repeated delaying use of the mason's level, the company says. Guides on the inside walls of the device direct the placing of the brick so that laying progresses just about as rapidly as a man can pick up the bricks and lay them down. Guides and side walls are designed to assure true courses and uniform joints. A master scoop beds 8 bricks with one scoopful. The bricks are then placed by hand. A second scoopful covers the course and a quick back-and-forth movement with a screed smooths the mortar and grouts it deeply into all joints. The machine is then unclamped and shifted to an adjoining position ready to repeat the operation.

The Brick-Lay-R Model 31 AB is fully adjustable for all brick sizes: 8 to 13-inch walls, 2 to 2½-inch brick heights, and 7½ to 8½-inch brick lengths. Right and left-hand operation are interchangeable. The side plates are collapsible for starter or wall courses. The three spirit levels are interchangeable. The jointing tool will provide concave, weathered, vee, and raked joints. It is supplied with a 2-inch core for hollow-wall construction. The Brick-Lay-R is 46 x 10 x 7 inches. Its weight, including accessories, is 30 pounds, shipped knocked down for quick assembly.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 104.

Hydraulic Control Unit

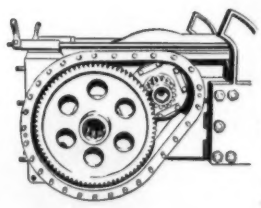
A hydraulic power control system for use with snow plows or other truck or tractor-mounted equipment is described in a bulletin issued by the Monarch Road Machinery Co., Hydraulics Division, 327 Front Ave., N. W., Grand Rapids 4, Mich. The bulletin stresses the advantages said to accrue through the use of the Hy-Lo-Jack unit.

The bulletin shows a photograph of the unit in place and explains how the control lever is located independently in the truck cab. A drawing shows the general construction of the unit and indicates the location of the precision-built pump, adjustable V-pulley unit, the positive 3-way valve, the universal mounting bracket, and the lever running to the cab.

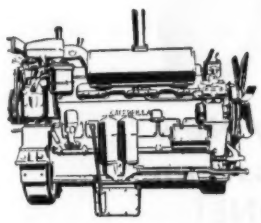
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 95.

Look under the hide

OF THE "CAT" DW10

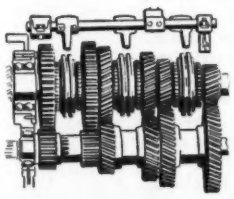


SPEEDS UP TO 24.5 MPH. Three complete ranges of speed are available with a choice of final drive gears. Many operators keep all three sets in stock to fit their DW10s to the job, ground conditions or haul distances. Differential-type rear end, combined with steering brakes, enables the DW10 to "walk" through soft spots on the fill. Full-floating drive axles are an assurance of dependable performance under the roughest of conditions.

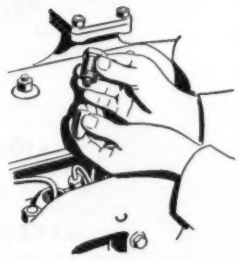


ALL-"CATERPILLAR" BUILT. Undivided manufacturer responsibility! Engine, transmission, clutch and final drive—all are 100% "Caterpillar" built and designed for each other. The engine, 115 honest horsepower, is known the world over for its dependable and economical performance. Its own independent gasoline starting engine is itself started electrically, or can be started by hand in case of battery failure. The engine is the heart of your operations . . . use the best.

EASY SAFE OPERATION. One way to get high earthmoving production is to design equipment for safety and ease of operation. Four-wheel stability; hydraulic booster steering; selective-acting air brakes on the DW10 and trailed unit; hydraulically controlled spring-mounted seat and unexcelled visibility—these add up to all-important reasons why operators prefer DW10s.



QUALITY BUILT. Typical of the quality designed into the DW10 is the constant-mesh, easy-to-shift transmission. A gear-type pump forces oil over the upper shaft to lubricate effectively the transmission on any grade. To insure long life, a large replaceable filter element guards against destructive abrasive materials. Just one of the many features that can boost production for you.



EASY TO MAINTAIN. "Caterpillar" has always designed for ease of service. Fuel injection equipment that can be replaced like spark plugs, with no adjustments required; a metallic-lined double-disc flywheel clutch that can be removed without disturbing engine or transmission—these are just two of many reasons why owners report full satisfaction. Hundreds of well-equipped "Caterpillar" dealers, each within easy job distance, constitute another reason why DW10s boost hauling profits.

CATERPILLAR

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DIESEL ENGINES

TRACTORS

MOTOR GRADERS

EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO.

Dept. CE-1, Peoria, Illinois

Please send me your latest booklet, "The 'Caterpillar' Diesel DW10 in Action."

Name _____

Address _____

Rubber-Asphalt Roads Are Built for Testing

Powdered Rubber Is Added To Plant-Mix and Then Spread In Usual Way With Finisher; Ohio Experiments

✦ THE use of powdered rubber in the construction of black-top roads was given tryouts in various parts of the country this past construction season. The rubber was incorporated with asphalt in the conventional hot-mix plant, and the mix was laid on the street or highway in the usual manner with a mechanical finisher. In the test sections that were built, natural, synthetic, and reclaimed rubber were used.

These so-called "rubber" highways are not exactly new. Before the last war they were introduced in Holland and the Netherlands East Indies, and are said to have stood up well under the pounding of German, Japanese, and Allied mechanized armies. Other features claimed for the rubber-powder mixture are heat resistance, greater elasticity, adhesiveness, high traction, resistance to water, and overall durability. These features would naturally reduce maintenance costs, and more than pay for the added rubber. Figures on construction costs are varied and incomplete, but those available run about 10 cents a square yard more than for asphalt 1½ inches thick.

After more than ten years the rubber-asphalt roads that were constructed in Europe and the tropics are still in good shape, according to reports, while other types of pavements have been given continual maintenance and need to be replaced. In this country the results of the test sections now completed will be watched with interest, but conclusive data on their performance are still some years away. Test sections have been laid in Ohio, Virginia, Texas, Minnesota, and on several New York City streets.

Ohio Experiments

With the rubber capital of the country located in Akron, the Ohio State Department of Highways was naturally interested in the use of rubber for pavements. In 1948 during the resurfacing of ½ mile of pavement on Exchange Street, Akron, rubber powder was added to some of the mix, and alternate sections of "rubber" and regular plant-mix pavement were laid for the purpose of comparison. One type of powder was used for this test—synthetic.

This year additional sections were laid on Main and Norman Streets, using such rubber powders as Indonesian natural, Goodyear synthetic, Firestone reclaimed, and Midwest reclaimed. The lane-wide sections are from 250 to 350 feet long. In the natural and synthetic sections, rubber equaling 5 per cent of the weight of the asphalt was added to the mix; with the reclaimed rubber, the amount added totaled 7½ per cent of the weight of the asphalt. Limestone coarse aggregate with natural sand was used, and the bitumen of the untreated mix totaled 6½ per cent.

State Route 14, a heavily traveled truck route, was also the scene of an experimental test section near Columbiana, Ohio. Since the section was close to steel mills, slag coarse aggregate and natural-sand fine aggregate was used, and the amount of bitumen was 8½ per cent of the mix. A total of 7½ per cent Firestone reclaimed-rubber powder, based on the weight of the asphalt, was added to the mix.

Paving City Street

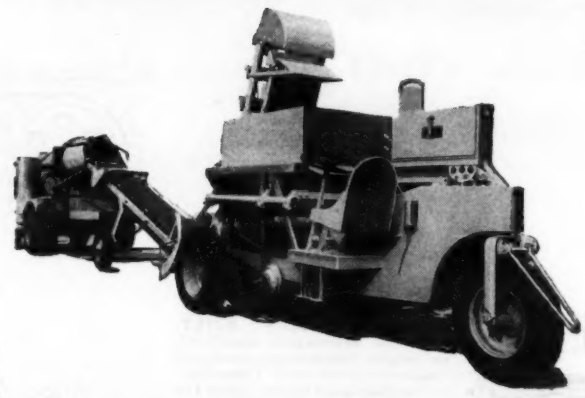
Another test section was laid on busy North High Street in Columbus, the state capital, in the neighborhood of Olentangy Village, a large housing development. This street is on U. S. 23 and carries heavy bus and truck traffic. The results of the "rubber" pavement will be observed here with particular attention to any pushing or shoving that might be caused by the starting or stopping of heavy buses.

This experiment was part of a regular resurfacing contract that the Ohio Department of Highways, with city participation, awarded to Max J. Zeller, Inc., of Columbus. The principal item was the laying of approximately 6,000 tons of plant-mix over a length of 5,781 feet in two courses. The work was completed during September, 1949, at a cost of $39,000. The base or leveling course varied in depth from ¾ inch to 3 inches, the crown at the center of the street being raised to cover the trolley car tracks which were no longer used. The surface course has a 1-inch uniform thickness. At this point North High Street is 65 feet wide between curbs, and the width of lanes that were laid varied from 10 feet 3 inches to 11 feet 3 inches.

C. & E. M. Photo
On North High Street in Columbus, Ohio, Max J. Zeller, Inc., lays a test section of rubber-asphalt plant-mix. A Barber-Greene Finisher places the surface course and a Galion Chief 10-ton 3-wheel roller compacts it.

(Concluded on next page)

Now You... DON'T NEED "BIG MONEY" TO GET INTO THE READY-MIXED CONCRETE BUSINESS



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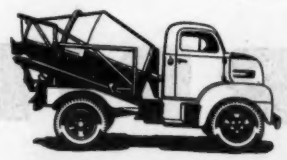
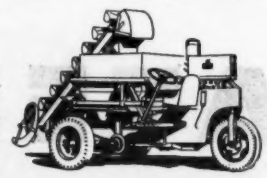
LIGHTER Costs half and weighs half as much as other 3-yd. mixers.

EXCLUSIVE Mixer gear box designed so loading and discharging speeds can be maintained; and then reduced for road.

Here's the new, modern low cost way to "handle" ready-mixed concrete . . . from mixing to pouring. Eliminates "Bunkers" and many costly operations. The three mobile units pictured do the entire job. A natural for the small sand, gravel, rock producer or material dealer wanting to get into the ready-mix business . . . at "rock-bottom" cost. A big time and money-saver for contractors, etc. for on-the-job batching. Also enables you to use bulk cement at a big saving. Developed by Carl L. Willard, inventor and pioneer builder of the transit type mixer. Write or wire for full details, and name of nearest dealer.



Willard Transit Mixer
3 Yard capacity. Light, strong, one man operated. Fits on short, easily maneuverable 1½ ton trucks, operating from truck engine power take-off. Built in water tank.



Willard Weigh-Batcher
Self-loading, self-powered. Picks up aggregate from open piles, accurately weighs in 3-yd. hopper by 3-beam scales. Loads a 3-yd. mixer every 5 minutes.

Willard Portable Conveyor
Self-powered. Takes batch from bottom discharge gate of weigh-batcher and dumps in truck mixer drum. Fast, mobile, rugged.

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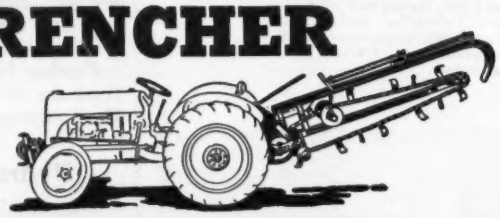

Digs up to 300 Feet Per Hour and Down to 5 Foot Depth, in favorable soil conditions.

A trencher that fits most popular makes of tractors with power requirements of two 14 in. bottom plows, manufactured at a price to make trench digging possible. Built with minimum working parts, with digger blades of high quality steel. Two rotary augers move the dirt away from trench. All adjustments can be made from the tractor seat either manually or electrically. Operated easily and successfully in most types of soil. Easy to transport behind tractor.

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TWO TRENCH WIDTHS
Interchangeable Blades for 7½ in. or 10 in. size

THE MISSISSIPPI ENGINEERING CO., INC.
Grand Mound, Iowa, Dept. CEM, U.S.A.

The mixture of rubber powder and asphaltic concrete was used only in sections of the surface course. The test strips were the width of the regular lanes and 400 feet long. Experimental sections were laid both along the curb and in the center of the street. To all appearances, the rubber and non-rubber mixes were the same in color and consistency; only time will tell the differences, if any, in the wearing quality.

The Mix

The plant-mix, designated by Ohio highway specfications as T-35, contained crushed gravel, sand, and asphalt cement with a 70-80 penetration for this particular job. The material was supplied by the local commercial plant of the Columbus Bituminous Concrete Corp., located 6 miles from the job. W. E. Anderson Sons Co. of Columbus delivered the hot-mix in 10 trucks that hauled 10 tons a load. A Barber-Greene Finisher laid the material which was compacted by a Galion Chief 10-ton 3-wheel roller, followed by a Buffalo-Springfield 10-ton tandem roller.

In the test sections Indonesian natural rubber was used, the powder equaling 5 per cent of the weight of the asphalt. The gradation of the base and surface courses is shown in the accompanying table.

Sieve Size		Percent Base		Surface	
Passing	Retained	Min.	Max.	Min.	Max.
1-inch	¾-inch	0	5	....	....
¾-inch	½-inch	5	20	....	....
½-inch	⅜-inch	7	30	0	7
⅜-inch	No. 4	10	35	25	45
No. 4	No. 6	0	10	0	15
No. 6	No. 50	20	45	20	45
No. 50	No. 200	3	15	3	15
No. 200		0	5	0	5
Bitumen		5	9.5	6	10

For the Ohio Department of Highways, T. J. Kauer is Director; Louis Wismar is Chief Engineer of Construction.

Economic Aspects

Wide variation in the amount of rubber needed per mile of pavement is evident from the reports on the work being done throughout the country. The Rubber Development Bureau of Washington, D. C., a subsidiary of the British Rubber Development Board, has sponsored some of the tests. The Board is endeavoring to expand the market for natural rubber. Much of the natural-rubber powder used in the experiments was supplied by the Dutch Rubber Foundation. Manufacturers of the synthetic variety and processors of the reclaimed rubber also furnished their products for the tests.

Some experts report that a ton of rubber would be needed to build each mile of new road, while others feel that from 5 to 8 tons of the powder should be used per mile of road. It is obvious, however, that reasonably low and stable prices of rubber would be necessary for its widespread use. The use of synthetic rubber would help to maintain this country's output of the product. In any event the highway industry is a potential buyer of rubber, whether natural or synthetic, provided the experimental test sections prove the worth of this new road-building material.

Celebrates 80th Year

The Round Chain Organization celebrated the 80th anniversary of its founding in December, with appropriate ceremonies in plants of five associate companies: The Cleveland Chain & Mfg. Co., Cleveland, Ohio; The Bridgeport Chain & Mfg. Co., Bridgeport, Conn.; Round California Chain Co., S. San Francisco and Los Angeles, Calif.; Seattle Chain & Mfg. Co., Seattle, Wash.; and Woodhouse Chain Works, Trenton, N. J. Round makes all types of chains, as well as material-handling equipment and wire specialties.

Catalog on Breakers

A new 16-page catalog describing five models of double-impeller breakers has just been announced by New Holland Mfg. Co., Mountville, Pa. A four-page section is devoted to the principle of dual-impact action and how it is built into the breakers. Cutaway drawings show how stone is reduced to desired sizes by impact in suspension with twin whirling impellers inside the breaking chamber.

Photographs of installations appear in another section describing each of the Models 1212, 2020, 3030, 4040, and 5050. Model numbers refer to the maximum size of stone in square inches that each model will handle. The folder also illustrates the double-impeller breakers installed as skid-mounted units and as part of one and two-unit semi-portable and portable crushing and screening plants.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 92.

Garrison HYDRAULIC POWER

STEERING BOOSTER INSTALLED ON ALLIS-CHALMERS

AD-4 MOTOR GRADER

- Reduces steering effort to easy one-hand operation
- Wheel fight and road shock eliminated
- Mechanical steering in effect with hydraulic assistance
- Easily installed in the field

Available in kits for AD-3, AD-4, BD-3 and BD-4 motor graders

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In addition to the standard line, special Southwest Dump Wagons, Tampers, Heavy Duty Compaction Units, etc., are giving outstanding performance on out-of-the-ordinary jobs all over the country . . . Why not let Southwest help solve YOUR problems?

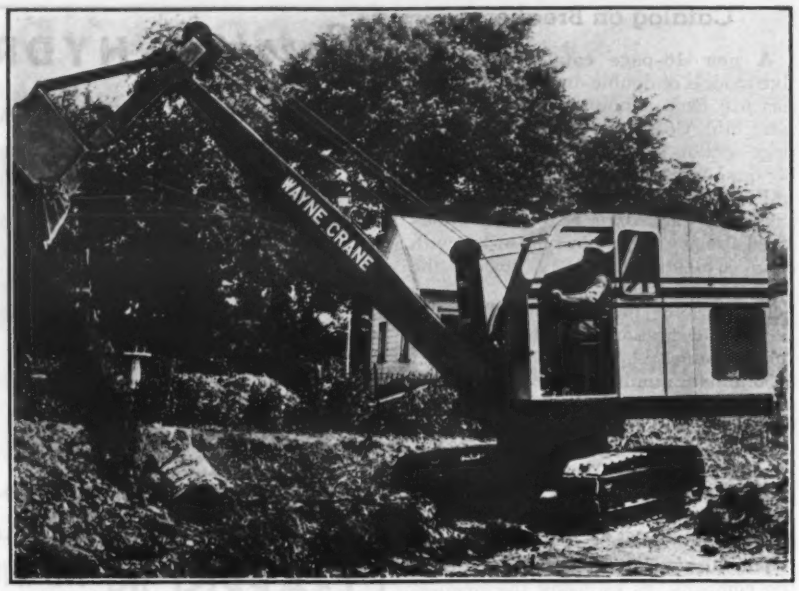
CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Company
ALHAMBRA, CALIFORNIA

A New Space Heater For Wintertime Work

A new type of portable oil-burning space heater for use by contractors and builders has been announced by the Ennis Supply Co., 334 N. First St., Minneapolis, Minn. Designed to throw 70 per cent of the heat downwards before it radiates to the walls and upward, the heater finds application for drying plaster, cement, and paint; heating frozen areas, shelters, construction offices, warehouses, etc. It is said to produce in excess of 50,000 Btu's per hour, heating more than 5,000 cubic feet to 70 degrees F with an outside temperature of zero.

The new heater burns No. 1, or lighter, fuel oil and requires no permanent stack. The circular shaped grille throws the heat in a full 360-degree circle, heating all corners of the space with emphasis on the floor area.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 124.



Shown here as a trench hoe, the Wayne Model 66 crane excavator is convertible to shovel, dragline, clamshell, and a magnet or 7.5-ton utility crane.

New Crane Excavator

A new ½-yard crawler-mounted excavator, known as the Model 66, has been announced by the Wayne Crane Division of the American Steel Dredge Co., 2000 Taylor St., Fort Wayne, Ind. The unit, illustrated as a trench hoe, is convertible to shovel, dragline, clamshell, and a magnet or 7½-ton utility crane.

The unit is powered through a direct-drive propeller-shaft assembly from the new "direct power flow" transmission. This transmission is remotely located from the power unit and is connected by a right-angle drive and universal drive shaft. This design is said to permit easy and less costly maintenance and replacement, and to reduce noise and backlash. The bearing length of the crawler is 8 feet 5 inches; it is 8 feet wide and is designed for stable 360-degree operation.

The upper works of the Model 66 are enclosed in a weatherproof inside-bolted cab. Other features include either a worm-driven or live boom hoist, unit replacement of all sub-assemblies, a built-in counterweight to reduce rear-end clearance of the cab, 15-inch-diameter drums for increased life of the wire rope, and anti-friction bearings throughout.

The new excavator has an all-welded chassis. It travels, lifts, booms, and swings simultaneously or independently. The swing speed is 6.2 rpm. Standard power unit for the Model 66 is a 6-cylinder gasoline engine designed to develop 62 hp at 1,800 rpm. However, any of several makes of diesel or gasoline engines of required power and speed may be furnished.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 7.

Concrete-Equipment Line

A catalog presenting a line of concrete chutes, carts, and mixers is offered by the Lansing-Co. of Lansing, Mich. Specifications, illustrations, and descriptions of each of these products are presented in this folder. A cross-section diagram illustrates the construction features of the Lansing tilter drum.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 112.

U. S. Pat. 2425132
Other Pats. Pending

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FASTER CHEAPER QUIETER

It's a fact . . . nothing drills concrete like a TERMITE *Rotary* DRILL! Saves you time and money on every job. The secret of the TERMITE lies in its *patented* action . . . it doesn't cut, it pulverizes! . . . you get more holes per dollar. Bores clean, true and fast because of the near-diamond hardness of the tip and the all-worm feature that carries away the pulverized material. See your dealer or write direct.

4 BIG FEATURES

- The *Termite* holds its gauge longer.
- Simple to use, no complicated attachments and no expensive air compressor, the *Termite* fits any ½-in. electric drill.
- No ear-shattering noise, the *Termite* is quiet.
- Eliminates breakage of concrete . . . the *Termite's* smooth, vibrationless action allows you to drill close to the sides and edges of concrete members without fracturing the concrete.

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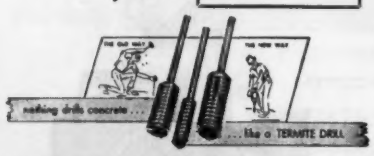

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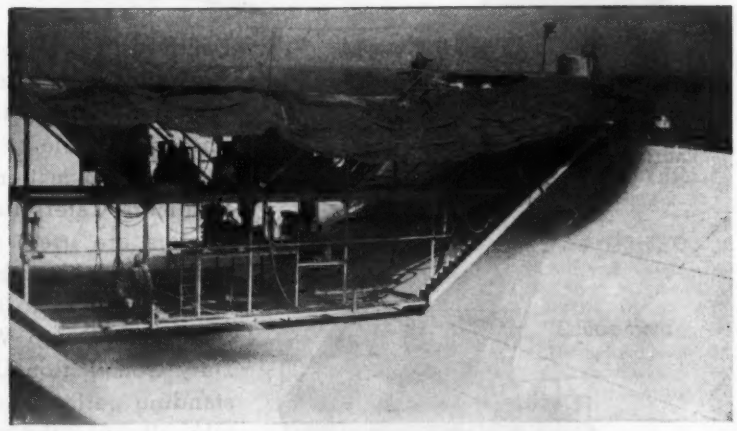

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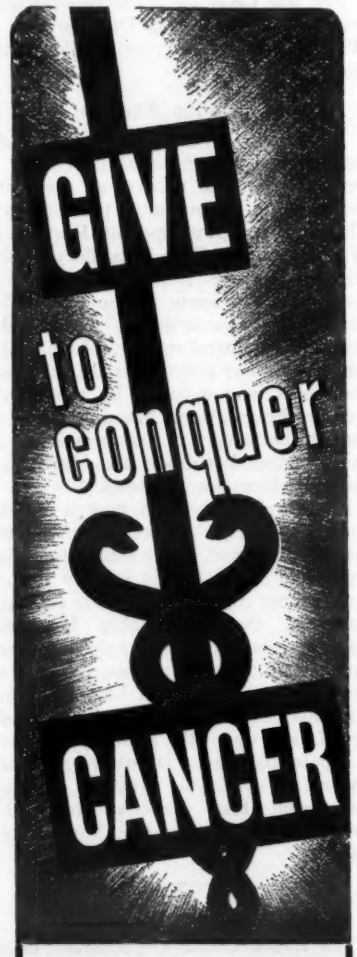

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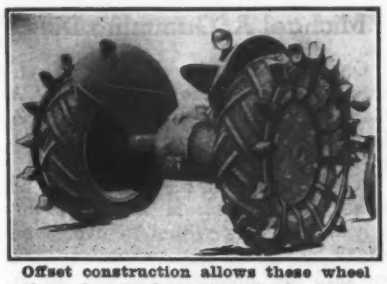

Offset construction allows these wheel rings for Ford tractors to be bolted tight against the wheel without spacers or bushings. Associated Handling Equipment Co. makes them.

Tractor Wheel Rings

New reversible tractor wheel rings, designed to fit any Ford tractor, are announced by the Associated Handling Equipment Co., of Grand Rapids, Mich. To obtain maximum gripping strength and long life, these rings feature an offset construction which allows the inner ring to be bolted tight against the wheel without using spacers or bushings. The welded frame is constructed of a ⅜-inch inner-ring steel strip and a ½-inch outer-ring steel strip. The cups, 16 per wheel, are drop-forged and made of manganese-steel alloy.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 41.

Snow-Plow Controls

The National snow-plow kit, a new hydraulic control for snow plows, is manufactured by the National Truck Equipment Co., 225 Madison St., Waukesha, Wis. It uses a compact hydraulic pump, called the Hydra-Clutch pump, with its own all-metal clutch. This pump operates only when the power is needed. A finger-tip control knob on the dashboard raises, holds, and lowers the plow. The kit controls the movement of the snow plow with a minimum amount of effort, whether the truck is moving rapidly or slowly, without using the truck clutch, the manufacturer reports.

The gear-type Hydra-Clutch pump includes its own adjustable safety relief valve. A self-contained ball check-valve holds any load automatically when the clutch is disengaged and the pump stops, according to the manufacturer. The double-wedge mechanism can be adjusted to take up wear. The pulley rotates freely on a double-sealed ball bearing when the clutch is disengaged. The pump is mounted under the hood and operates off the fan belt. Installation of the entire National snow-plow kit is simple, and the unit is designed for most makes of trucks, the company states.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 84.

Bulldozing Operations

Several applications for bulldozers are presented in a new booklet, Form 12172, put out by Caterpillar Tractor Co., Peoria 8, Ill. Photographs accompany the 16 pages of information describing rocky hillside cutting, stripping work, road construction and maintenance, land clearing, and river channel diversion. Cross-sectional drawings illustrate blade features and operating mechanism.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 5.

Nylon Cord for Tires

Savings and safety are the principal benefits to be derived from using truck tires with Nylon cord, says a new booklet called "Nylon Cord Truck Tires" issued by the Nylon Division, E. I. du Pont de Nemours Co., Wilmington 98, Del. The booklet presents several accounts of performances by Nylon tires.

Du Pont states that more recapping of tires is possible due to Nylon's combination of properties. The fiber's resistance to deterioration or loss of strength by moisture, for example, reduces the hazards of tread cuts and cracks that expose the carcass to water, the company says. Nylon's strength and light weight result in additional tire benefits.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 56.

Leaves ARBA for CAA

Walter Macatee has resigned as Manager of the Airport Division of the American Road Builders' Association to join the Civil Aeronautics Administration in Washington as Highway Transportation Specialist. He will be connected with the Office of Airports, and will devote a large part of his time and energy to city-to-airport highway projects. He will continue to contribute his assistance to the Airport Division, however, as an individual member.

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Capacities through 75 Ton—Semi and Full Trailers

CARGO CARRIER MODEL MSO (Semi) With Four Trunnion Rear Axles.

Engineered for the very heavy loads.

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*CORR-PLATE on the Job! Sewer Job at Fort Wayne, Indiana, crossing the St. Mary's River, used 8 Gauge, Standard Section, 20 Foot Lengths.

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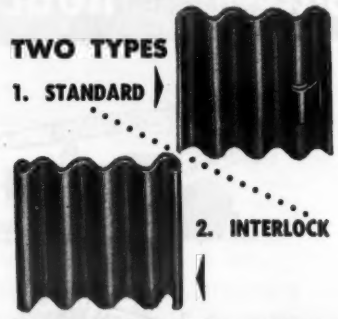

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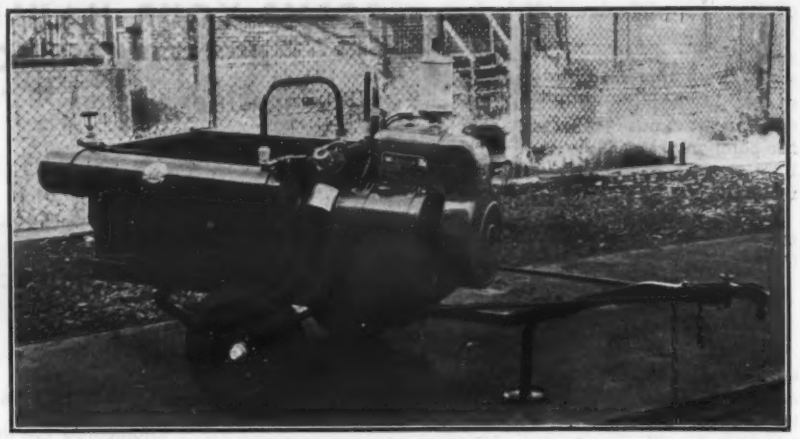
Portable Compressor Will Deliver 33 CFM

A new heavier-duty compressor, called Model 33, has been announced by the P. K. Lindsay Co., 97 Tileston St., Everett 49, Mass. A product of 30 years of experience in the construction of portable air compressors, this unit retains the portability of other Lindsay models yet increases the scope of pneumatic equipment which the line will operate, the company says. It supplements the Model 22 for service trench digging.

The Model 33 has a displacement of 50 cfm and delivers 33 cfm at maximum recommended speed. Working pressure is adjustable to 100 pounds. Multiple air chambers provide cooling and eliminate pulsations; unloading is automatic. Power is supplied by a 2-cylinder 11-hp gasoline engine. An adjustable speed governor enables the operator to vary the capacity to suit the work being done. An electric starter and generator are available as optional factory installations.

In addition to the standard portable mounting, which weighs 450 pounds, the Model 33 is offered skid-mounted as the Model S-33 and trailer-mounted as the Model T-33. The skid-type unit is designed for truck mounting, and the trailer model makes a complete working unit for carrying tools and equipment out on the job. The trailer is equipped with semi-elliptical springs and, like the standard portable model, is mounted on pneumatic-tired wheels with precision tapered roller bearings. It can be readily towed behind an automobile or moved by hand.

Further information may be secured direct from the company. Or use the Request Card at page 16. Circle No. 27.



The new Lindsay Model 33 compressor delivers 33 cfm at its maximum recommended speed. An 11-hp gasoline engine powers it.

Corrosion-Resisting Rope

Over 130 different sizes and types of stainless-steel and Monel-metal wire rope are cataloged in a new folder released by the Macwhyte Co., of Kenosha, Wis. Typical uses for each rope are listed, and the various types available are described and illustrated. This rope is preformed and corrosion-resisting, according to the manufacturer. A full range of sizes from 1/64 to 1 inch in diameter is offered.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 80.

New Safety Belts; Shock-Absorber Type

New shock-absorber belts made of Unolyn safety rope or webbing are designed to provide protection for the user because of their ability to spread the load by elongating to several times their original length. These new safety products, made by the Rose Mfg. Co., 1731 Arapahoe St., Denver 2, Colo., are now available for the first time.

Unolyn is a form of Nylon; in fact, it becomes Nylon when elongated, and then has approximately 75 per cent greater strength than the draw load required to elongate it into its final form. This ability to elongate to approximately 5 times its original length under relatively constant loading, without rebound, is what gives Unolyn its effectiveness as a shock-absorbing material, the company says.

The principles involved vary widely with the type of belt. For instance, with a construction-worker's belt, the lifeline is normally attached to a beam or other anchorage of unquestioned safety, and the man can be permitted to fall only a short distance to avoid striking some obstruction. His belt should have a relatively strong shock absorber. The Safe-Hi shock-absorber construction belt has a double Unolyn web strap with a total draw load of approximately 1,200 pounds.

Safety-engineered lanyards and lifelines of any specified length and terminal arrangements may be obtained: ½-inch and ¾-inch manila hemp rope, ½-inch and ¾-inch Nylon rope and steel cables—with safety-lock snaps at both ends, or a snap at one end and at the other end a thimble spliced into the D-ring of the belt.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 85.

Michael A. Gammino Dies

One of New England's foremost contractors died recently — Michael A. Gammino, President of the M. A. Gammino Construction Co., Providence, R. I. He was 59 years old.

As a boy of 14 he worked for his father, a contractor in western Pennsylvania, staying with him five years. At 19 he started out on his own, and in 1915 he incorporated the M. A. Gammino Construction Co.

At the time of his death he was President of the Rhode Island Road Builders' Association. Mr. Gammino was also prominent as a real-estate dealer, bank executive, and a stock breeder.

Clyde Representative

Harry E. Greenwood has taken up headquarters at 224 S. Michigan Ave. in Chicago as factory representative for Clyde Iron Works, Inc., Duluth, Minn., in the northern half of the midwest territory.

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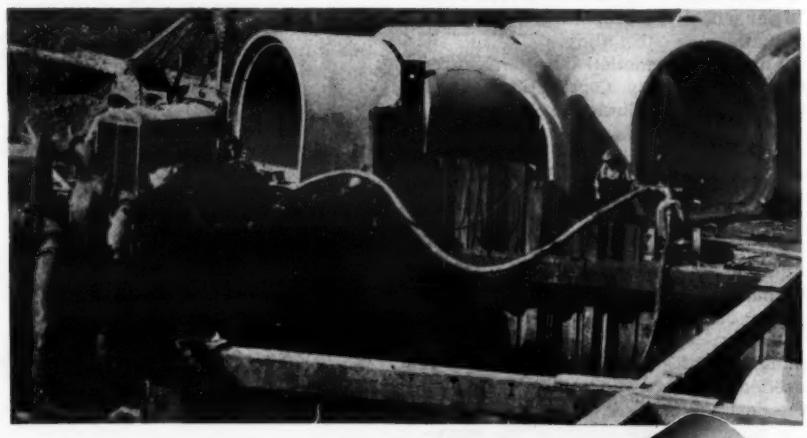

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Belt Line Paved Despite Traffic

Concrete Slab Replaces the 20-Foot Bituminous Mat in Center; Modernizes Highway Built 18 Years Ago

✦ IN spite of heavy midsummer traffic on Belt Line Highway 71AP, around the east side of St. Joseph, Mo., Atkinson-Windle Co. of Chillicothe finished a new portland-cement concrete pavement in the center of the highway. The 4.36-mile $174,780 project modernizes a road which was built in 1931.

Traffic in the St. Joe area was not as bad in those days, but even so, the belt-line highway was built 4 lanes wide. Each of two 10-foot outer lanes consisted of 9-7-9-inch thickened edge concrete slabs, which have stood the test of time in satisfactory condition. As a stop-gap measure, the center 20-foot portion was covered by a 2-inch bituminous mat, laid on a bare subgrade.

Now that truck traffic is so heavy, maintenance costs are up on the center portion. Replacement of the bituminous mat for a distance of more than 4 miles is expected to take care of that situation for a long time to come. The work was done where the traffic was heaviest.

Atkinson-Windle's men and equipment, however, had to excavate and remove the old center portion to a depth of 8 inches and pave the new slab while traffic counts of 15,500 vehicles per day whizzed by on the existing concrete slab on each side of the new work. It was hazardous business, both for the contractor's men and for the drivers of automobiles.

Started July 19, the job was finished and cleaned up by August 18, a day less than one month later.

Interesting Excavation

The center portion consisted of some 14,069 cubic yards of Class A excavation, composed of bituminous mat, a small amount of gravel, and common dirt. It turned out to be a very interesting grading project. It was so tough that when high-lift tractor-loaders were put in to remove the mat, their operators couldn't stand the bouncing, brutal punishment the old asphalt surface returned.

After that scheme had failed, an Athey Force-Feed Loader was rented. This machine was used with a Caterpillar No. 12 motor grader and some locally rented dump trucks. This plan proved successful. The Caterpillar grader each morning went in and ripped up about 1,500 linear feet of the old mat. The broken material was then windrowed, and the Athey machine loaded it out. When it had removed the first layer, the motor grader scarified another layer loose with its teeth and blade. So long as there was any material left, it maintained a windrow for the Athey loader. Since the excavation contained nearly 50 cubic yards per station, the 1,500-foot section each day gave the machines about 750 cubic yards to move in 8 hours. This enabled the equipment to stay out in front of the paving gang, which was making close to 1,400 feet per day.

C. & E. M. Photo

This paving line-up at the start of a pour on the St. Joseph belt-line highway includes a Koehring 34-E Twinbatch paver, a Jaeger spreader, and a Jaeger Type K finisher.

The disposal of excavation had promised to be somewhat of a problem, but the new highway was lined with roadside stands, parking areas, and drive-in theaters. Their owners all wanted as much of the material as they could get. As a result, the hauls were short enough that Logan Mason, General Superintendent for the construction company, was able to get along with a minimum of dump trucks.

The material was removed to within ⅛ inch of full depth, on an average. A 6-ton smooth-wheel Austin-Western steel roller then compacted the grade, mashing it down very close to neat lines.

Fine-Grading

Fine-grade dressing consisted of a pass or two, if necessary, by the Caterpillar motor grader. There was also an

(*Continued on next page*)

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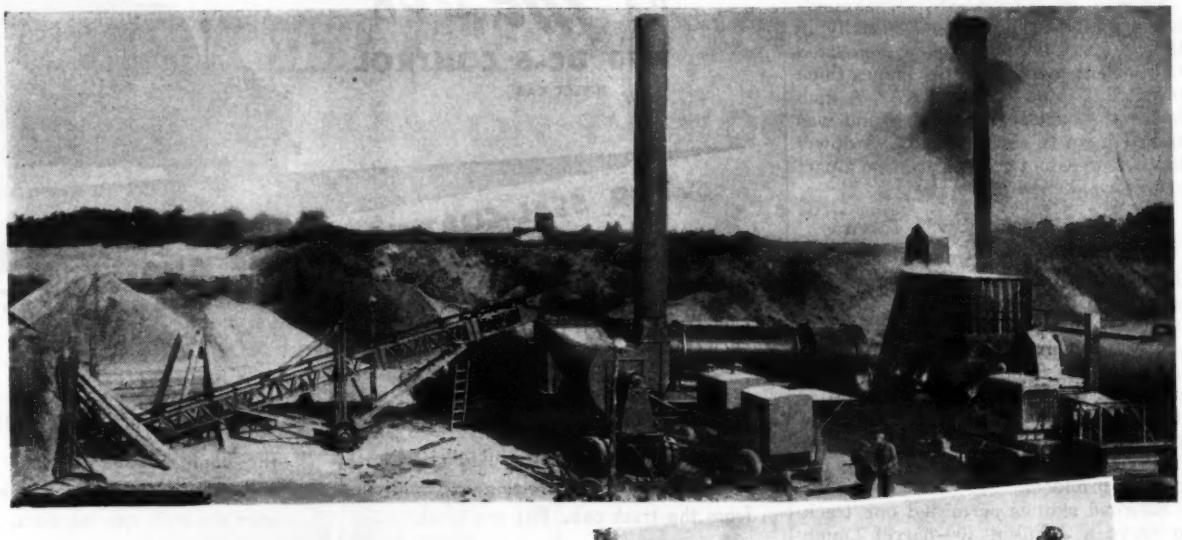

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Belt Line Is Paved In Spite of Traffic

(*Continued from preceding page*)

Allis-Chalmers Model S, with a Cleveland tail blade, which did final dressing. The machines occasionally scooped up some excess material, which was handled to a dump truck by a D4 and a Traxcavator loader.

No form work was necessary, since the new slab was formed by the vertical sides of the old one. The subgrade was checked ahead of the pour by stretching a string line across from one slab to the other and measuring the distance to the dirt. Final rolling just ahead of paving was done by the 6-ton Austin-Western steel-wheel roller.

Plenty of Joints

Expansion joints were eliminated on the project, with the exception of 1-inch mastic filler at a small bridge. The old pavement was equipped with contraction joints on 40-foot centers. The new slab has joints which meet these centers, and another joint halfway between, making contraction joints every 20 feet.

In addition, a metal-strip weakened-plane joint was built longitudinally in the center of the new slab. A deformed lightweight metal strip 7½ inches thick forms this joint. It was placed ½ inch below the surface of the slab and was staked in to the subgrade. Steel dowel tie bars on 5-foot centers are also a part of this weakened plane.

Batch Plant Set Up in Town

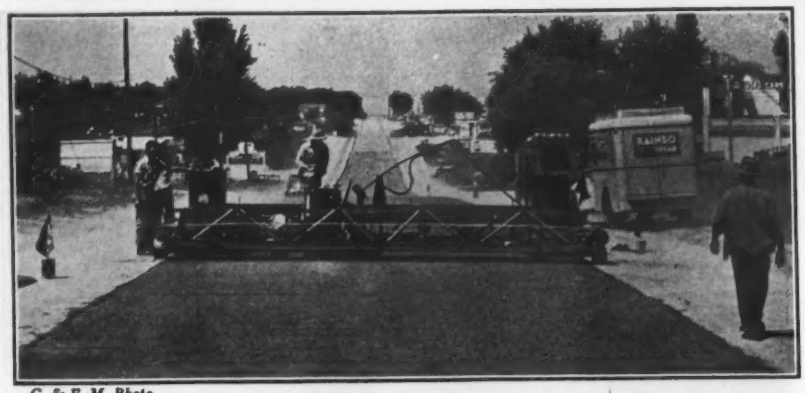
Aside from a 2½-mile dead haul through city traffic, the batch plant was set in an ideal location, only 500 feet from St. Joseph's Union Depot. Rock aggregate had to be received by rail from Stewart Sand Co. at Pixley, Mo., and bulk portland cement from Missouri Portland Cement Co. also came in by rail. The sand was trucked in locally from Pioneer Sand Co., a commercial producer.

Railroad sidings permitted one track to serve a Johnson 100-barrel Dutch Mill cement silo, while another spur brought cars to the 75-yard Johnson batch bins. The entire arrangement was within easy walking distance to the depot, where switching service could be arranged and freight tickets completed.

The sand and aggregates were unloaded by two machines: a 1¼-yard Koehring clamshell-crane, and a smaller ¾-yard P&H 255-A. These clams unloaded 16 cars of rock and 10 cars of sand per day, on an average, transferring the material direct from the cars to bins, or to stockpiles near by where it could be reached later on.

The batching plant was run under the supervision of Nick Marsch, an interesting character with long years of experience as a clamshell operator behind him. Nick has seen the time—and his superintendent backs him up—when he ran the batching equipment *and* the clamshell too! Moreover, he batched 20 cars a day then, so it was no dinky job. He got a little help from his oiler then, he admits, when the trucks piled up and the bins ran a little low.

Dry-batched concrete from the plant was hauled in 23 Ford and Chevrolet batch trucks, hired by L. M. Chambers of Kansas City. Hauling through the heart of St. Joseph, the trucks made it through the dangerous job without a single bad accident. A. R. Mills was Chambers' Superintendent on the job.



C. & E. M. Photo
A new Heltzel Flex-Plane automatic spray machine with a broom in front puts the final finish and cure on the St. Joseph belt-line highway.

Paving Draws Crowds

The line-up of present-day paving equipment drew crowds throughout the work. The August sun was hot, some of the crowd was feminine, and some of the girls were clad in shorts. The paving crew didn't seem to mind the crowd at all.

Traffic was a major problem. Flagmen at both ends and deputy sheriffs in the middle of the work were used. They slowed traffic down sufficiently to make it crawl past the paving equipment. With batch trucks turning around to back in, and haul traffic ahead where the middle section was being excavated, it presented quite a serious situation.

The line-up of paving equipment was impressive. There was a 34-E Koehring Twinbatch paver, a Jaeger spreader, one of the new Jaeger Type X diagonal-screed finishers, a Flex-Plane contraction-joint cutting machine, a Koehring longitudinal float finisher, and joint-cutting and finishing bridges. The last machine in the line was a new Heltzel Flex-Plane curing-brooming machine.

Using a 35-foot boom and a heavy bucket which held the 1¼-yard batches

(*Continued on next page*)

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with ease, the big paver was spotted on the subgrade in the center of the pour. The trucks backed in to its skip to discharge the two batches they hauled.

The company had three new 1,500-gallon water-tank outfits on Ford trucks built 3 years ago, and the aluminum tanks were still in perfect shape. These machines hauled water from city hydrants; it served as mixing water and for sprinkling subgrade when the dust got bad. The trucks which fed water to the paver were connected by a rubber hose, and the paver pump drew the water in as required.

The concrete mix consisted of a blend of 1 part cement, 2.1 parts sand, and 4.1 parts rock aggregate. After 60 seconds in the paver, the mixed concrete was dumped to the subgrade. The power operator tried to spread the material as evenly as possible, making it easier on the other machine.

As the material was dumped and spread, three men puddled it around the edges and set the metal center-joint material.

The 1-inch-slump concrete was distributed evenly between the concrete slabs by the Jaeger spreader, and then the new Jaeger finisher made its first pass. With a long surface tube vibrator mounted on the front of its frame, the finisher consolidated and put the initial finish on the material.

Every 20 feet the plans called for contraction joints 2 inches deep and about ¼ inch wide at the top. These joints were formed by placing steel V-strips down in the slab in a groove made by the Flex-Plane machine. These strips of metal stayed in the concrete until after the longitudinal float finisher had completed its work. Then, when the concrete had just begun to take on its initial set, the metal strips were lifted, and men working from small bridges shaped and edged the joints.

Special care had to be used in shaping these joints, to maintain a smooth-riding surface in the slab. The metal strips were not lifted until the concrete had set up sufficiently to resist distortion. The edges were carefully shaped. In fact, it required 7 concrete finishers to keep up with this hand work.

The edge of the new pavement, where it met the old concrete, was also shaped up with edging tools. No dowels were used between the new and old construction, and a smooth joint was made.

One of the newest machines now in use in the concrete paving field made its appearance on this project. It was the new Heltzel Flex-Plane curing and brooming machine. The machine had a flat belt in front, extending all the way across the slab, on which was mounted a fiber broom. As the machine went slowly along, this broom passed at right angles over the surface of the slab, exerting a uniform pressure on the concrete. The result was a mechanically broomed surface without the usual imperfections of a manually broomed slab. At the same time, the machine sprayed Hunt Process membrane curing solution on the surface of the slab behind the rig.

The best day's run was 1,549 feet. This could be appreciated to its full extent if one could see the constant stream of traffic which passed the work. Paving was done 6 days a week, 8 hours a day, with the active pouring finished up at 3:30 p.m. Caring for the concrete slab until the curing agent was applied to the last bit took about 2 more hours, on an average.

C. & E. M. Photo
Atkinson-Windle Co. used a novel pressure rig to apply plastic Tarvia filling in contraction joints on a 4.36-mile concrete paving job in Missouri.

Joints Filled

Filling the contraction joints was in itself a man-sized project. Specifications called for the joints to be filled with plastic Tarvia, a sticky black material which has been used for years to fill cracks, patch rooftops, and do other waterproofing work.

It has often been the practice in the past to apply this material by hand with a trowel, working it in carefully. Something new was used here: a pressure application device similar to the guns now in use on irrigation-canal lining in the western United States.

The gun consisted of a 6-foot piece of aluminum pipe, terminating in a narrow slotted opening through which the material was expelled. An Alemite pressure head, mounted on the drum, sent the material out through a hose. Air was furnished through a small surge chamber by a Jaeger 105-cfm compressor. All of the foregoing equipment was mounted on a small flat-bed trailer, which was pulled by a rubber-tired Oliver tractor.

The Tarvia was applied after blowing out the joints with a blast of compressed air. Irregularities in the filler surface

(*Concluded on next page*)

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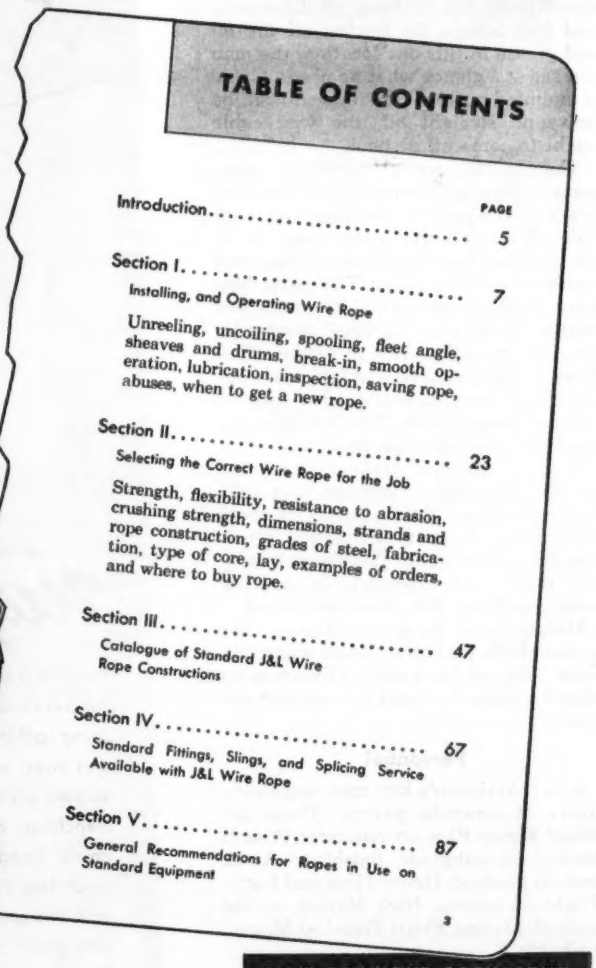
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Belt Line Is Paved In Spite of Traffic

(*Continued from preceding page*)

were quickly smoothed out with a steel trowel, and the machine then moved on to the next joint. When traffic started to pick up some of the material, the cracks were dusted lightly with portland cement.

The completed slab was protected from any traffic for a period of 5 days. A supply of standard steel road-form sections was brought to the job, and these were laid end to end along the fresh concrete. Lighted flares at night were another traffic-control device.

A Mobile Outfit

In company with other progressive paving outfits in the midwest, Atkinson-Windle Co. is highly mobile. The use of trailers for the storage of parts and important materials has minimized losses from theft, and moving from one point to another is now a matter of hours.

One big trailer houses the office. Insulated all around by a minimum of 3 inches of spun glass, the office is delightfully cool in summer and warm in winter. It has ample desk space, file cabinets, and storage closets for stationery, payroll forms, and records.

Another trailer houses spare engines, vibrators, form tampers, and other small but important power equipment around a paving project.

A third trailer contains lubricating oils, greases, cable, and paint. It is the responsibility of one man on an Atkinson-Windle job to keep all lubricants and fuel handy. By having all the oil and grease in this one location, the man can see at a glance what he needs. Cable is mounted on spool holders, and can be unwound straight off, the way cable ought to come off a spool.

The fourth trailer contains spare parts. Of special interest is the fact that every spare part is cataloged on card index files, and that every part in its bin carries a tag with its description and manufacturer's number. The parts bins were built by several of the men last winter. When a part is used, mechanics save its tag and turn it in to the office. Thus if the part is one which needs replacement very often, another can be ordered immediately. The bins are also arranged for complete machines.

A machine-shop trailer contains a power lathe, shaper, grinder, post drill, battery charger, and a supply of spare bolts. Some delicate emergency repair jobs have come out of this shop already, and more are expected. In another trailer, nothing but tires are stored.

Mason hopes to get another trailer to store bolts and other small materials, along with one he wants to fix up as an office for inspectors and the resident engineer.

Personnel

All of Atkinson's key men were old-timers at concrete paving. These included Elmer Rice on concrete; Russell Powers on subgrade finishing; A. E. Zook on grading; Henry Huss and Larry Wright on curing; Nick Marsch on the batch plant; and Floyd Fishel as Master Mechanic.

All of these men worked under the general supervision of Logan Mason, Superintendent.

For the Missouri State Highway Department, under whose direction the project was designed and built, Carl W. Brown is Chief Engineer, with J. J. Corbett in general charge of operations in his post as Engineer of Construction. L. H. Williams was Project Engineer, but he was transferred to another project before this one was finished, and Bob Wells took his place. Bob Myers was Plant Inspector and Martin Douglas was Slab Inspector.

Completion of the new section will do much to increase traffic flow around St. Joseph with a much greater margin of safety. The heavier pavement will also very likely reduce maintenance costs, since the existing bituminous mat was hardly more than an oiled surface with no sub-base.

For Driving Sheeting Or Breaking Pavement

A bulletin describing Worthington paving breakers and sheeting drivers is now available from the Worthington Pump & Machinery Corp., Harrison, N. J. It presents a 34, 50, 81, and an 85-pound breaker; and a sheeting-driver attachment for the 81 and the 85-pound breaker. Full specifications, descriptions, and illustrations are given for each model. Applications for each tool are indicated. The sheeting-driver heads are equipped with three sets of cheek plates to handle 2, 2½, and 3-inch sheeting.

This literature may be obtained from the company or by using the Request Card at page 16. Circle No. 12.

The Whitestown trencher is now available for use on the Allis-Chalmers HD-5G tractor equipped with a TS-5 Tracto-Shovel attachment. It will dig to a depth of 8 feet and dump at a height of 12 feet.

Heavy-Duty Trencher

A heavy-duty trench digger, designed for use on an Allis-Chalmers HD-5G tractor equipped with the TS-5 Tracto-Shovel attachment, has recently been released by Whitestown Trencher Co., Inc., Wood Road, Whitesboro, N. Y. This trencher will increase the productivity of the HD-5G from 30 to 50 per cent, the company says, and is easily attached by using the same pins as are on the 1-cubic-yard bucket loader.

The Whitestown trencher is equipped with a ½-yard standard bucket. Special buckets, made to individual specifications, may be obtained. It will dig to a depth of 8 feet and dump at a height of 12 feet. It is designed for a wide variety of trenching and excavation work.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 122.

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Here is a mobile, utility-size trencher — Parsons rubber-tired Model 80 Trenchmobile — for handling off-street connections, installing conduit, gas lines, water services, in new subdivisions, on airport maintenance, etc. All those small, tedious trenching operations formerly done by slow, costly hand methods can now be handled in much less time, at less cost, and less supervision with this one-man operated Trenchmobile. Opens new profit possibilities to small contractors . . . fills an important need in speeding up schedules of public utilities and municipalities.

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Mechanical improvements and increased performance are featured in the new Model 25-C impactor offered by Wayer Impactor Sales Co., 12 N. Third St., Columbus 15, Ohio. For better tamping, the impact has been increased to 1,250 foot-pounds delivered at a speed of 1,900 blows per minute. The new unit is provided with a self-priming constant-speed carburetor, flexible "break-proof" gas line, heavy-duty fuel tank, anchored bolts and screws, longer-life shock absorbers, and more efficient heating of the tamping-finishing plate.

The machine is self-propelled and capable of tamping and finishing flush with curbs, manholes, car rails, and walls. Paving and railroad-crossing maintenance; laying driveways, parking lots, and factory floors; and tamping ditches are its principal applications.

It may be operated by common labor and has an average consumption of 1 gallon of fuel a day, according to the company. Compact size and an overall weight of 240 pounds permit the impactor to be carried in light trucks.

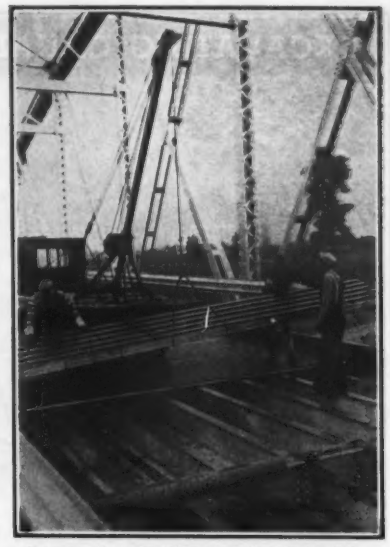
Further information may be secured from the company. Or use the Request Card which is inserted at page 16. Circle No. 55.

Tamping action in the new Wayer Model 25-C impactor has been increased to 1,250 foot-pounds delivered at a speed of 1,900 blows a minute.

Materials Spreading

A 4-page folder describing the Jet multiple-service spreader, designed for use on standard light trucks, is available from the Good Roads Machinery Corp., Minerva, Ohio. Though truck-borne, the jet is self-contained. Its heavy-duty air-cooled power unit is capable of driving the twin spinners at a speed of 2,400 rpm, according to the bulletin. The spreader is one-man push-button-controlled from the cab of the truck. It will handle sand, lime, gravel, salt, calcium chloride, and cinders.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 47.



Corrugated structural-plate-steel bridge flooring, a product of United Steel Fabricators, Inc., replaces wooden plank flooring on a 683-foot structure.

New Bridge Flooring Of Corrugated Steel

A new structural-plate-steel bridge flooring, designed for the replacement of wooden plank flooring on highway bridges, viaducts, overpasses, and similar structures, has been announced by United Steel Fabricators, Inc., Wooster, Ohio. The flooring section is a 2-inch-deep trapezoidal corrugated type, with a laying width of 33 inches. It comes in standard lengths of 6, 8, 10, and 12 feet and can be fabricated to full roadway width. It is available in 7, 10, and 12 gages for various loadings and stringer spacing.

Features claimed for the new product include elimination of the maintenance required for plank flooring, reduced dead load on a structure, speedy and economical installation, a stiffening effect on old structures, simplified bituminous surfacing, no danger of "corduroy" effect from traffic, and economy in amount of surfacing material required.

The trapezoidal corrugation is designed to provide a uniform section developing a high section modulus. A vertical 1-inch return flange on each side provides for plates to be butted together for accurate placement and full section efficiency. Slots are punched in every corrugation to correspond with stringer locations to permit welding of the plates to the bridge structure. Adjacent plates are welded together with 3-inch-long bead welds between stringers.

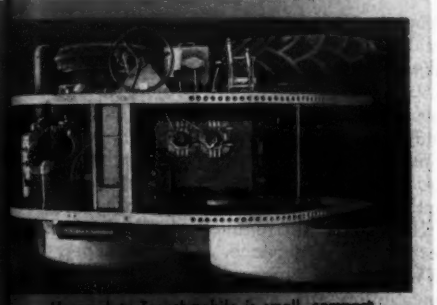
The shape of the structural-plate corrugation affords economy in the use of steel and minimum bituminous surfacing requirements, the company says. Using a 1½-inch-thick wearing course, only 17.5 square inches of asphalt are required per foot of cross section, it is reported. Either hot or cold-mix can be used with the flooring. Installation is claimed to be very rapid since a truck can back onto a span as fast as the plates are dropped into place, and welders can follow up, welding plates to the stringers and bead-welding the plate joints. All slotting, joining of lengths, and cutting for skewed bridges are shop-performed.

Further information can be obtained direct from the company, or by using the Request Card at page 16. Circle No. 22.

Builder Ups Engineer

The Austin Co., Engineers and Builders, of Cleveland, Ohio, and Seattle, Wash., has appointed B. Thor Bjornstad District Engineer in the Pacific Northwest. He is a registered professional engineer in Washington, Oregon, and Idaho, and he joined Austin as a structural engineer in 1940. He will make his headquarters in Seattle.

Model 80



Heavy-duty Trenchmobile is small, compact . . . overall width is only 4'11" . . . wheelbase, 4'6". 31 H.P. engine provides 8 digging feeds forward to 14.65' per min., 4 reverse . . . plus travel speeds from 2.94 to 18.9 m.p.h.

Controlled discharge lets Trenchmobile work efficiently in close quarters . . . reversible conveyor discharges spoil on either side. Reverse traction gives vertical set-ins against foundation walls . . . no hand work. Sloping boom undercuts mains, sidewalks, curbs and gutters.

Early-attached dozer blade (optional) doubles Trenchmobile usefulness. Does a fast job of backfilling. Trenchmobile's fast roadability cuts time between jobs, increases work time and profits. Automotive type steering and truck type hydraulic brakes give positive, safe control for travel on highways and city streets.

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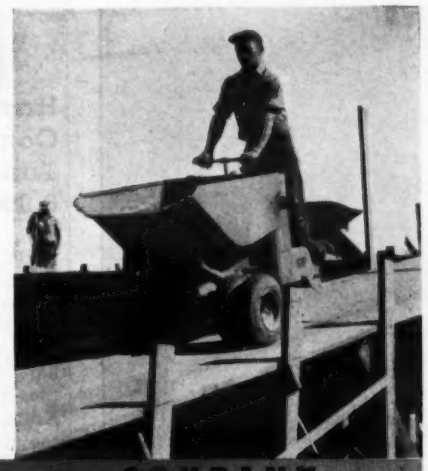

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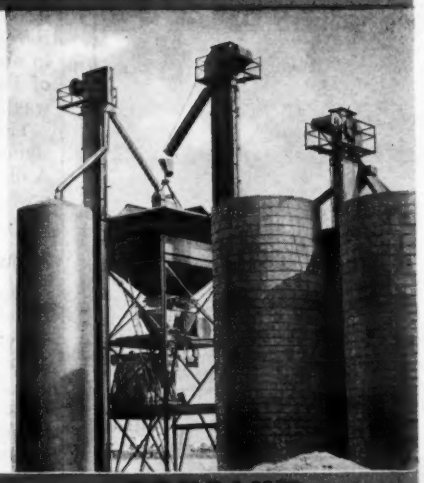

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Sixty-hole blasts rocked Wyoming dust and rock fragments toward the sky as Morrison-Knudsen Co., Inc., of Boise, Idaho, pushed excavation of Wyoming Canal, part of the Riverton Reclamation Project.

Heading the list of drilling equipment was this Parmanco 4-inch auger drill, which was assisted by Gardner-Denver wagon drills.

Machines Blast Path

Hard Rock Excavation, Concrete Structures, and Tunnel Develop Another 6,000 Acres at Riverton

By RAYMOND P. DAY,
Western Editor

✦ BY November, 6 months ahead of schedule, the big Riverton Reclamation Project in central Wyoming was richer by 8,000 acres, thanks to the effort of men who braved wind, cold weather, hard rock, and rattlesnakes to hurry the great project along. Morrison-Knudsen Co., Inc., of Boise, Idaho, did the work under a $1,600,000 unit-bid contract with the U. S. Bureau of Reclamation.

M-K's work brings in another 6,000 acres of the ultimate 100,000-acre land development program centered around Riverton, Wyo. A 1948 contract brought in about the same amount of land east of Pavillion, Wyo. Last year's activity was a continuation of that work.

The Riverton Irrigation project is designed to use water from Wind River. A diversion dam was built for this purpose about 1924, and the project has been developing ever since.

Job Includes Variety of Work

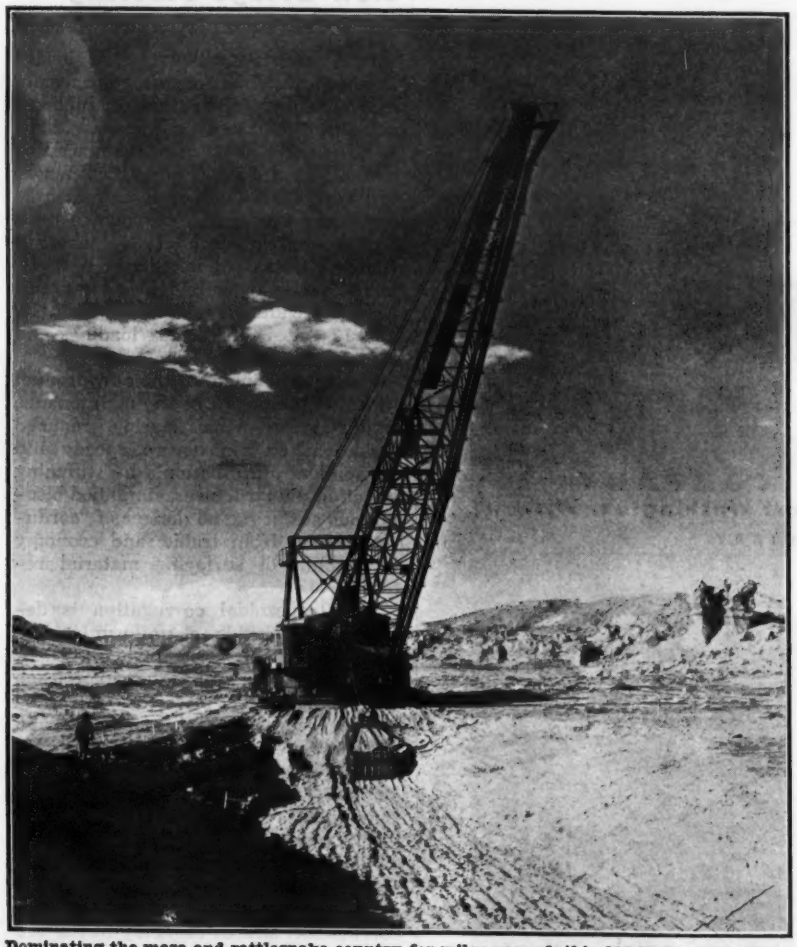
The construction which Morrison-Knudsen has done covers a wide variety of work. It called for about 20 miles of main canal, laterals, and sub-laterals; and 2,840 feet of tunnel through Muddy Ridge. According to Bureau of Reclamation terminology, the main, or Wyoming Canal, required earth work, tunnel, and structures from station 1606+00 to 2560+00. Earth work and structures on the Muddy Ridge Canal from station 0+00 to 20+00 were in included, along with Laterals W31.69 to W44.69, sub-laterals, and wasteways.

In order to push the project to the best advantage, Morrison-Knudsen took only the 1,800,000-cubic-yard excavation item on the main canal, subcontracting most of the remainder. A subcontract was arranged for concrete structures on the main canal, which was let to R. S. Lieurance, Jr. The Casper, Wyo., firm of Sharrock-Pursel took all excavation and structure construction on the lateral and sub-lateral system, while Wixson & Crowe of Redding, Calif., arranged to drill and line the tunnel under Muddy Ridge.

With operations synchronized under the general supervision of Morrison-Knudsen's General Superintendent I. D. Robbins, excellent progress was made. This despite the fact that hard rock, a tunnel, over 100 checks, drops, chutes, siphons, wasteways, and turnouts stood in the way of the combined forces.

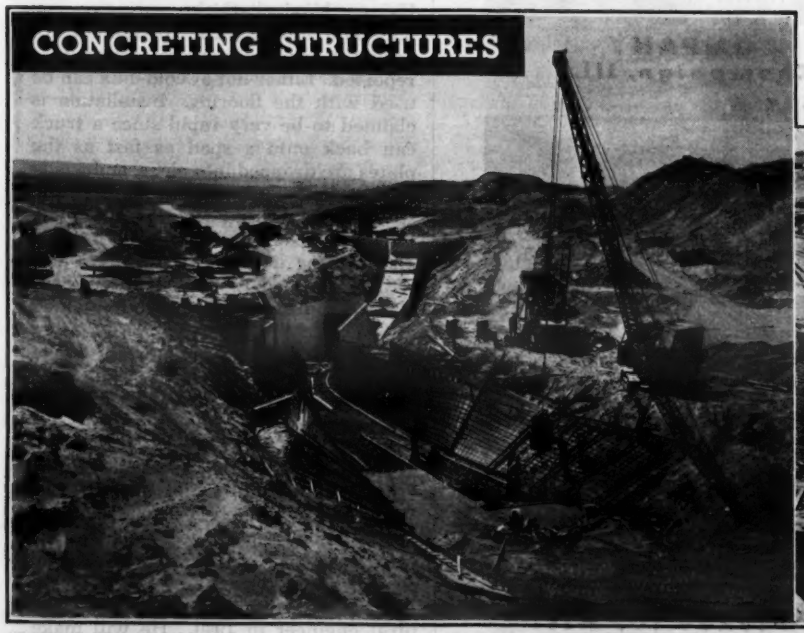
The main Wyoming Canal follows the natural land contour around the escarpment of a high mesa in a near-elliptical path, and the laterals take off at strategic points down toward lower country in the valley. The main canal, which will carry 567 cfs of irrigation water, was unlined, except for those sections where structures were located. In Schedule 1 the bottom width of the main canal was 36 feet at the take-off point, slimming down through a transition section to 26 feet. Schedule 3

(*Continued on page 42*)

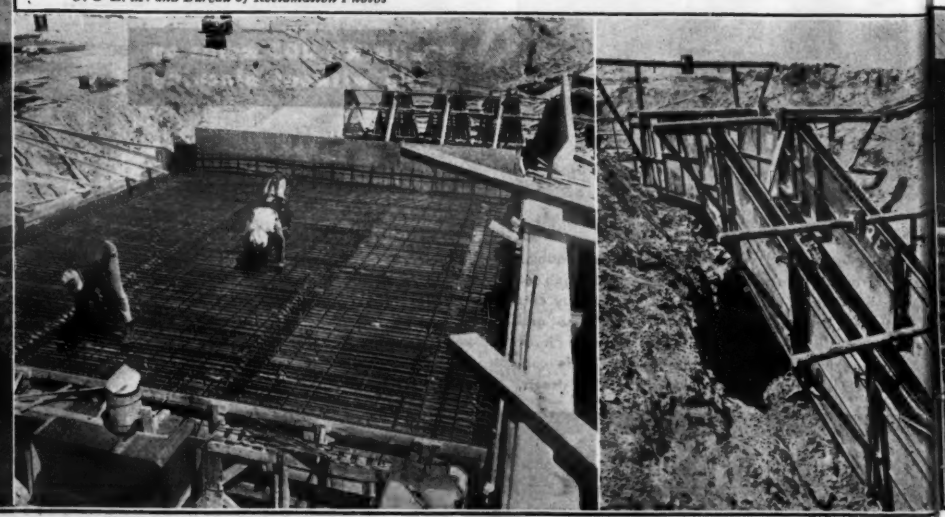


Dominating the mesa and rattlesnake country for miles around, this 200-W Bucyrus-Monighan walking dragline slashed its path through 1,800,000 cubic yards of excavation.

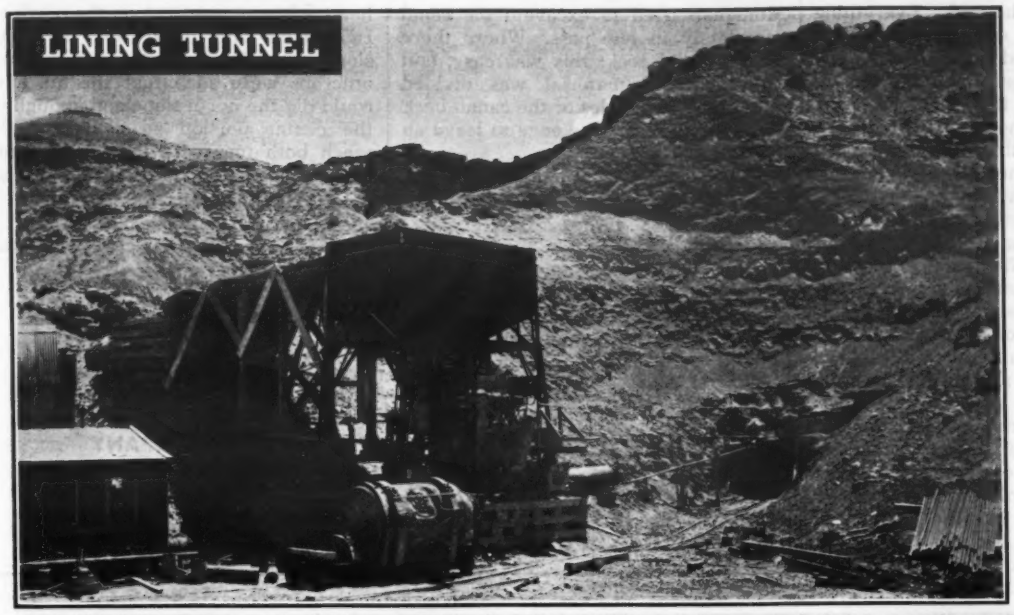
C. & E. M. and Bureau of Reclamation Photos



Sharrock-Pursel subbed from M-K all structure concreting on the laterals. R. S. Lieurance, Jr., handled those on the main canal. Here's one of the pouring set-ups.



At left, reinforcing steel goes in on one of the structures—there were over 100 checks, drops, chutes, siphons, etc., on the job. At right, steel forms in place on a structure.



The Muddy Ridge Tunnel work of M-K's contract was subbed by Wixson & Crowe. It included excavating and lining a 7½-foot-diameter 2,840-foot-long horseshoe bore to carry water under a long low ridge to the main canal.

To save track-laying in winter, this trestle was built so trains could move out and dump their loads of excavated rock.

For Irrigation Work

Excavation, Concrete Lining Of 2,840-Foot Bore Are Full Of Headaches Due to Small Size of Tunnel

✦ ON July 30, 1949, subcontractor S. L. Wixson drove up to the north portal of Muddy Ridge Tunnel, 30 miles northwest of Riverton, Wyo. The Pumpcrete machine was out in the sunshine. An exposed end of the last pour stuck out at the portal. "Red" Wixson grinned at T. L. Powell, his lanky superintendent.

"Well, that's the way you wanted to see it, isn't it?" he said.

Powell said, "Yeah, I've been waitin' a long time for this. I've been tellin' these tunnel stiffs they'll go blind in the daylight."

Ever since the fall of 1948, equipment and men of the Redding, Calif., firm of Wixson & Crowe have been hard at work on Muddy Ridge Tunnel, under a subcontract with Morrison-Knudsen Co., Inc., contractor with the U. S. Bureau of Reclamation. Muddy Ridge Tunnel, a straight 7-foot 6-inch finished-diameter horseshoe bore about 2,840 feet long, will now carry irrigation water from Wind River under a long, low ridge which separates the water supply from irrigable lands enclosed by Morrison-Knudsen's new main canal, described in the companion article to this.

Driven in winter, through some of the most severe weather Wyoming has had in a decade, the small-diameter tunnel posed a number of problems, each of which was solved in some unique manner. For example, when winter weather threatened to freeze up the railroad tracks outside the portal, an 18-foot trestle was built, and the muck was shoved to the dump ground by bulldozer. It was the first time many of the tunnel stiffs had ever seen a tunnel job done without a railroad-track crew working outside the portal.

When the small-diameter tunnel refused to take a standard-size Pumpcrete lining rig, they cut the machine down and built their own auxiliary hoppers to size to maintain surge capacity. Records were established, too. A 15-hole round 6 feet long was completely drilled out in 28 minutes one record day.

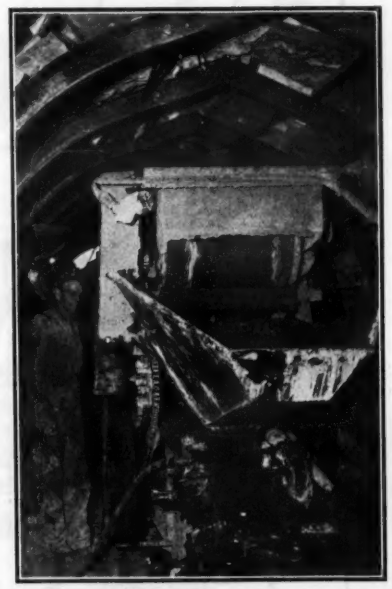
Tunnel Driving

Tunnel excavation began at the north portal, continuing until the crew holed through at the south portal. Both portals were faced off by drilling, blasting, and removing the stone back to solid rock. Approximately 1,000 feet of the bore ran through a soft blue shale, while the remainder lay in a formation of gray sandstone. The latter formation was easy to drill, and it held its shape nicely without falling in. This was not true of the shale, which slaked and fell in sometimes beyond the permissible excavation limits.

Despite these characteristics, the entire tunnel was driven without the use of bracing, except for a few hundred feet at the portals, where steel H-beams were installed as a safety measure.

A 500-cfm Gardner-Denver compressor was brought in and set up. Through the cold winter months it, a

(*Continued on page* 61)

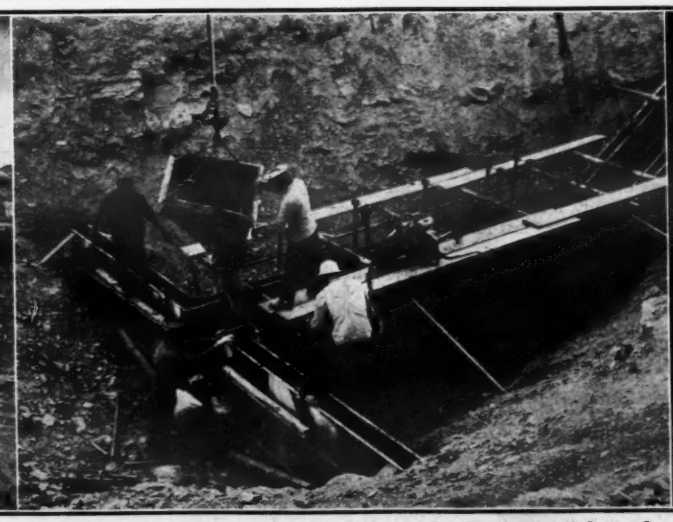


The Pumpcrete hopper had to be reduced in size to fit into the small-diameter tunnel.

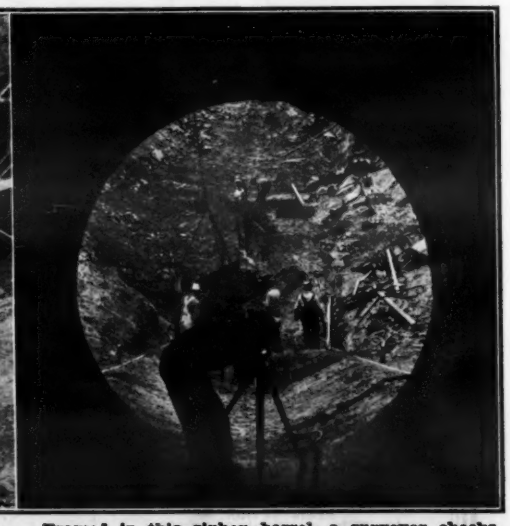
This is the Pumpcrete delivery pipe with its standards.

Wooden bulkheads held the tunnel liner pours at the end.

One of Sharrock-Pursel's three concreting set-ups: barrow on Winslow scales, Rex mixer, Koehring crane.



Here a transfer bucket is swung over a pour by the crane and dumped. Then workmen vibrate the fresh concrete with Jackson vibrators.



Framed in this siphon barrel, a surveyor checks carefully the work out ahead.

Machines Blast Path For Irrigation Work

(*Continued from page 40*)

called for a canal bottom of 26 feet, while Schedule 4 farther down the country narrowed down to 22 feet. Depths ranged from 3 feet in flat country to one 65-foot-deep rock cut. All main canal side slopes were 1½ to 1.

Laterals were much smaller, of course, ranging in bottom width from 3 to 4 feet, with 1½ to 1 side slopes. The mileage of laterals was great enough to pose a 250,000-yard excavation item, however, and there were 2,500 cubic yards of reinforced concrete in the lateral structures. The main canal structures subbed to Lieurance required 4,500 cubic yards of concrete.

The Muddy Ridge Tunnel, details of which are given in the companion piece to this article, was a horseshoe-shaped affair with an inside diameter of 7½ feet. Its concrete lining had a theoretical thickness of 8 inches, but overbreak on shale gave the Bureau of Reclamation a slightly thicker lining at Wixson & Crowe's expense. The tunnel was straight, and was drilled from the north portal.

Situated 30 miles northwest of Riverton over a gravel road, the project was isolated from civilization and many of the key men and operators lived in tents or trailers in the desert. Rattlesnakes were so numerous as to cause men to look twice before taking a step. Two were killed the day the job was visited for this magazine; one taking a peaceful nap by the side of a 50-pound box of high explosives.

Monighan Digs Canal

The 1,800,000-cubic-yard slug of excavation which M-K chose to do was unclassified. Through Schedule 1 the digging was easy, and the big 200-W Bucyrus-Monighan walking dragline slashed its path to the tune of about 9,000 cubic yards every 24 hours. When the machine hit Schedule 3, blue shale and sandstone appeared to fight the machine, and 60 per cent of that schedule had to be drilled and blasted. When the rig got to Schedule 4, it was almost solid drilling and blasting.

Canal excavation was done by first grading a road for the Monighan, then excavating and drilling if necessary, with final dressing which cleaned up the edge of the equal spoil banks on either side of the canal.

Two Caterpillar D8's with Wooldridge scrapers built the road ahead of the Monighan. This road was something more than just a flat piece of ground to hold the digging base and walking pontoons of the machine. Chief Operator Ray Thomas, who ran the rig on the day shift and supervised the road building, has some pretty definite ideas arrived at through bitter experience.

He was running a 9-W Monighan for J. A. Terteling on a big canal job some years ago, when all of a sudden one morning it rained. Thomas didn't like the way his digging road sloped in toward the canal, but the work was already done and there was nothing he could do about it. He had to keep on digging.

"I had just set my pontoons down and made a step," he said. "Everything appeared to be all right, until the digging base cushioned down on the mud. Then the whole machine started to slide right off into that canal!"

According to Thomas, it was more instinct than fast thinking which caused him to start another step, which put some down pressure on the pontoons. "The Lord was with me, because the upper pontoon hung on a cypress stump and stopped the million-pound machine just as the pontoon on the low side reached the canal edge!" Thomas said.

That taught Thomas to watch his digging road carefully, and to this day he likes to have it sloping just slightly toward the outside spoil banks, rather than toward the center of the canal. If he finds rock now, and has to make two passes, "it's a lot easier to get away from the spoil bank than to explain why a machine slid into the canal!"

Using an Esco 6-cubic-yard rock bucket on a 120-foot boom, the 200-W Monighan tried to excavate the canal completely in one pass. Where there was no solid rock, this was easy, and the excavated material was divided equally on both sides of the canal, back about 60 feet from the edge to leave an access road.

Where rock was found, it was another matter. In that case, the Monighan made a pioneer cut on the north or right-hand side, excavating the right slope and as far down as possible. Rock outcrops were such that the machine could dig the north slope and enough of the center portion so drillers could reach both toes with drill steel. This often entailed the removal of about 65

(*Continued on next page*)

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per cent of the material in the cut, but since it opened the work up for the drillers, it was worth it. The equal division of spoil material was "guessed" at by these experienced operators, and the piles were mighty evenly balanced.

After the canal bottom had been drilled and shot, the Monighan then returned to dig the remaining section which it had left, and at the same time it picked up the blasted rock.

One deep 65-foot cut was particularly troublesome. It was practically solid rock. The machine and the drilling crew chewed along on this digging for the better part of the winter, finally removing it all. The rock was so abrasive when the big Esco bucket bit through the material that it wore a set of teeth out in only 24 hours, unless they were continually replaced. A welder worked full time hard-facing the big teeth with Stoody Self-Hardening rod, and as the teeth wore down they were replaced and the worn ones re-faced before they wore out completely.

The rock drilling posed a rather unique condition, in that it was possible to make good progress with auger-type drills. Heading the list of drilling equipment was a Parmanco 4-inch auger drill, assisted by a Gardner-Denver wagon drill. At one time six pneumatic hand drills were also used. The Parmanco machine had its own power, and the other drills received air from a 315-cfm Worthington Blue Brute compressor. Timken steel and bits were used on the latter equipment, while the Parmanco machine used standard auger bits.

Drilling was done under a wide variety of conditions, but it did follow a general scheme. Charlie Larson, experienced old powder man originally from Sweden, liked to get his 4-inch holes down at the toe lines at centers from 12 to 20 feet. He carried his drilling about 2 feet below grade on the canal bottom, and also went about a foot below slope grade. Since the canal was unlined, the slight overbreak damaged nothing and made the work a great deal easier for the Monighan, which regularly turned out about 2,500 cubic yards per shift in broken rock after Charlie Larson had finished with it.

The rock was sometimes filled with hard chunks of heavy black basalt, with a few pieces of rare agate and obsidian. It drilled very hard, and required special treatment. When these boulders were found, they had to be drilled with a wagon drill.

Larson loaded the holes with about ½ pound of powder to the cubic yard. He first gave the holes a heavy springing by using about 30 pounds of Atlas or Hercules 60 per cent powder. Then he loaded the shots with 40 per cent bag powder practically to the top, to get as much shattering action as possible. As a rule about 60 holes were set off at once by hooking the shots in series, putting a No. 6 electric cap in each, and turning on the 220-volt electrical current of a Kohler light plant. Many of the shots were shallow, but on the 65-foot cut the blasting was done in only two lifts, going down over 30 feet each time. In that cut, half the width was drilled and shot at one time, in order to give the Monighan and the drill crew a place to work at the same time.

The Monighan did a great deal of finish work as it went along, particularly on the canal slopes. The canal bottom and the topside area between the edge and the spoil bank was dressed by a D8-mounted bulldozer.

Lateral Excavation

Lateral excavation was on a smaller scale than the main canal, but it furnished full-time work for two 1¾-cubic-yard rigs, one a Bucyrus-Erie, the other a Lorain. Plenty of rock was found on the lateral excavation as well as on the main canal, and it had to be broken by high explosives. Sharrock-Pursel used a 315-cfm Ingersoll-Rand compressor with 55 and 85-pound I-R Jackhamers, along with Timken steel and bits.

The rocky sections were drilled usually on 3-foot centers and loaded with gelatin-type powder. A hand blasting machine and electric blasting caps were the means used to put off the shots.

(*Continued on next page*)

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Also a Magic Method for Saving Money and getting your Tarpaulins Repaired with our New Master Process Weaving Machine.

CALL OR WRITE FOR PRICES

ADMIRAL CANVAS PRODUCTS
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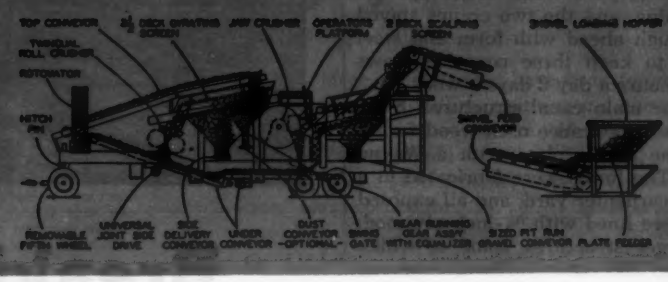
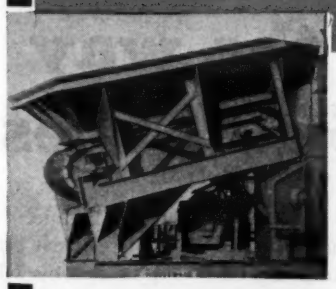
It's Admiral All Along The Canvas Line

NOW! 3 STAGES OF CRUSHING 2 SCREENS IN 1 GRAVEL PLANT

UNIVERSAL 293-QS
Greater Capacity with Real Flexibility





This apron feeder replaces scalping screen for quarry rock.

Gravel pits containing large rock are no longer a problem. Because the jaw crusher is much larger, the 293-QS takes oversize rock ordinarily rejected. Universal Engineers took the famous Universal 293-Q TwinDual Pacemaker quarry plant, removed the apron feeder, and installed a scalping screen. This screen scalps pit oversize to the primary jaw crusher and screens out sand and gravel not requiring crushing. Material requiring secondary crushing is by-passed to TwinDual Rolls.

100% chips can be produced, or finished material from the scalping screen blended with crushed material from the plant. This flexible high production gravel plant can be converted in the field to quarry operation when the situation demands. One investment provides a plant that really meets today's demands and tomorrow's changing needs. It has many other features you should know. Write for complete details.

Jaw and roll crushers, hammermills, screens, conveyors and bins in any combination—stationary or portable.

UNIVERSAL ENGINEERING CORP., division of PETTIBONE MULLIKEN CORP.

620 C Avenue N. W., CEDAR RAPIDS, IOWA — Phone 7105
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PMCP
HAISS NEW YORK, N. Y. — UNIVERSAL CEDAR RAPIDS, IOWA.

Machines Blast Path For Irrigation Work

(*Continued from preceding page*)

Blasted material was all cast to either side of the canal. Some of the structures required considerable deep excavation, much of it in rock. A great deal of this material was wasted, while better earth was saved for backfill. All the structures were backfilled by pneumatic tampers, or by flooding.

Structure Form Work

Sharrock-Pursel arranged a system of form work which was so effective that 38 structures were placed in less than a month. These structures ranged in yardage from 3.4 to 30. The steel forms were made up in the subcontractor's Casper yard. The panel sections were so sized that they could be rearranged to make a wall higher and longer. Thus the panels were usable many times in the more than 100 structures which dotted the lateral and sublateral system.

The forms were braced against spreading by vertical 1½-inch pipe stiffeners on each outside wall of the panels. These were tied together by steel form bolts. A special stiffener-spreader device, made of 4-inch and 2-inch pipe, was also employed on each location. The top section of this device was adjustable for width, which permitted it to be used in a wide variety of locations.

Sharrock-Pursel pushed its work in a systematic way, working one section straight through to its completion as much as possible. A Koehring truck-mounted crane would move in to a structure location and set the outside steel form. Then prefabricated reinforcing steel mats, built up previously in a central steel yard, would be trucked in and set. The Koehring would then set the inside steel form panels, and remain on the site to make the pour by handling a transfer bucket between the mixer and the forms.

Next morning it would strip the outside forms and move them ahead to the next pour, to repeat the performance. A Lima ¾-yard truck crane did the same thing, and the two cranes stayed far enough ahead with form and steel setting to keep three concrete crews busy 8 hours a day 6 days a week.

On the main canal structures, Subcontractor Lieurance used wood forms, which he set in place with a Wayne crane. The forms were fabricated in a central carpenter yard, and all exposed faces were lined with ⅝-inch plywood. The larger structures, some of which contained 800 cubic yards of concrete, were not quite so standardized as those in the Sharrock-Pursel part of the work.

Individual Set-Ups for Concrete

At the start of the job, an attempt was made to batch and pour the concrete from a central mixing location. This proved to be unsatisfactory for Sharrock-Pursel, and the concrete scheme was changed to an individual set-up for each structure, regardless of its size.

The concrete aggregates and sand were produced for the Bureau of Reclamation by Gilpatrick Construction Co., which also delivered the material to each structure site upon arrangement. The Government also furnished the cement, using Type V Monolith Sulfate in bags.

Sharrock-Pursel used three separate concrete-pouring crews, each with about the same men and equipment. In each crew there were 10 men: a mixer operator, 3 wheelbarrow men, a cement dumper, a crane operator, a vibrator man, a concrete-bucket dump man, and 2 concrete finishers.

Equipment in each set-up included a Rex mixer, one 16-S and two 11-S machines being used for the three "spreads". There was a truck crane at each pour, two machines taking care of three crews. Each crew had an allotment of wheelbarrows, a set of Winslow weighing scales, and a 3,000-gallon truck-mounted water tank which hauled mixing water from a canal supply at the tunnel.

The most common concrete mix, known as No. 3, contained for every 2 sacks of cement 521 pounds of sand, 425 pounds of fine aggregate graded from 3/16 to ¾ inch, and 429 pounds of coarse aggregate from ¾ to 1½ inches in size. The mix was calculated for a cement content of 4.70 sacks per cubic yard, with 5.5 gallons of water per sack. While the mix was figured for a 3-inch slump, it was placed somewhat stiffer than that. Sharrock-Pursel used enough Protex to entrain from 3 to 5 per cent of air in the batch.

Concrete materials were proportioned by weighing each wheelbarrow load of material, and dumping three wheelbarrow loads into the mixer skip at

(*Concluded on next page*)

PORTABLE BELT CONVEYOR

- Ideal for handling concrete
- For conveying sand and gravel
- Husky for tough work
- Easy to operate
- Economical to run

Model 17 is specially suited for stockpiling materials from portable aggregate plants because the discharge end is at maximum distance from the wheels:—you heap larger piles of material without burying the wheels. Extra-large tires mounted on swivel axles permit easy lateral movement for maximum piling.

Write for illustrated circular with specifications.

ATLAS CONVEYOR COMPANY, CLINTONVILLE, WISCONSIN

Breaking the way for 1500 Buses an hour

In the heart of New York City, a full city block is being cleared of old buildings to make room for a new $20,000,000 bus terminal. Scheduled to be completed in 1950, the terminal will handle an estimated 60,000 passengers daily—a peak load of 1500 buses an hour!

Razing the old structures is no small job in itself. Most of the buildings are of massive construction, with heavy brick walls and reinforced concrete floors, necessitating the use of dependable heavy-duty equipment.

Ingersoll-Rand portable air compressors and hard hitting I-R paving breakers are playing an important part in completing the demolition on schedule. Breaker-wise contractors everywhere insist on Ingersoll-Rand paving breakers powered by I-R Portable Compressors because years of hard service have shown them to be consistant profit makers. Before buying your next Breakers or Portable Compressors be sure and get complete information on Ingersoll-Rand equipment. There is a branch office near you.

DONT STOP WITH A GOOD PAVING BREAKER
Use the IR CONTRACTORS' COMBINATION
- Everything you need for rock drilling.
- Top quality machines that work as a team.
- Machines designed, built, sold and serviced by men who know rock excavation . . . application "know how"

427-5

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.
COMPRESSORS · AIR TOOLS · ROCK DRILLS · TURBO BLOWERS · CONDENSERS · CENTRIFUGAL PUMPS · OIL AND GAS ENGINES

once, along with the cement. A small stockpile, carried at the scales for each type of material, permitted some adjustment to get the correct weight.

When the material had been mixed 1½ minutes, it was discharged out of the Rex mixer directly to a ¾-yard transfer bucket with a canvas spout. This transfer bucket was then handled to the pour by either the Koehring or the Lima truck crane, where a man held a small baffled steel guide to permit the material to be dumped at a rapid rate. A Jackson vibrator consolidated the concrete; finishers were right there to finish it off with steel trowels and edging tools; and all exposed surfaces were cured with Hunt Process white solution. This cure was also used next day after the forms had been stripped.

Lieurance used the crane transfer system of concrete placing, but his mixer was a 16-S Jaeger, and for a while he used truck-mixers. The batches were proportioned by a small portable manual concrete batcher, and hauled in dry form by batch trucks to the mixer. There the cement and mixing water were added. Lieurance also used Hunt Process cure.

Tedious and painstaking as the structures were, compared to the fast-moving directness of canal excavation, they were generally built on a precision schedule at a speed which matched the Monighan and other subcontractor excavating equipment.

A severe cloudburst on September 18, 1948, washed out a structure or two and poured water down over the desert, but the damage was repaired and work continued in high gear. Some parts of canal excavation were carried on through the severe winter, and concrete was placed right up to the time when tarpaulin covers and heaters had to be used to keep it warm.

Completion of this contract makes about 6,000 acres of new land available, which is expected to be opened to buyers some time in the near future.

Personnel

The work was designed under the supervision of L. N. McClellan, Chief Engineer of the USBR, with Kenneth F. Vernon as Regional Director at Billings and T. L. Clark as Construction and Project Engineer. R. H. Workinger of Cody, Wyo., is the manager of the Bureau's Big Horn District in which the Riverton Project is located.

For the contractors, I. D. Robbins was General Superintendent for Morrison-Knudsen Co., Inc.; assisted by Jack Phelps, Project Engineer; Fred Webber, Office Manager; K. L. Swan, Master Mechanic and Excavation Foreman; and Ray Thomas, Chief Operator on the Monighan. Earl Rook was in charge of structures for Sharrock-Pursel, and Bud Davis had charge of their excavation. R. S. Lieurance, Jr., supervised his part of the subcontract.

NRMCA and NSGA to Hold Joint Convention, Exhibit

The 20th annual convention of the National Ready-Mixed Concrete Association and the 34th convention of the National Sand and Gravel Association will open jointly on Tuesday, the 24th of this month, at the Stevens Hotel in Chicago. The featured speech of the morning session will deal with the responsibilities of the businessman in 1950. There will be no afternoon session.

On Wednesday morning of the double-header convention, at a joint session, H. S. Fairbank, Deputy Commissioner of the Bureau of Public Roads, will talk about the Federal-Aid highway program and its problems. Ewan C. Clague, Commissioner of Labor statistics, will discuss "The Economic Climate of 1950", and Leland Hazard, Vice President and General Counsel, Pittsburgh Plate Glass Co., will discuss "Security and a National Labor Policy." Samuel C. Hadden, Chairman of the Indiana State Highway Commission, will speak at the luncheon.

The associations will split up on Thursday to concentrate on their special merchandising and operating problems, and both will conclude their conventions on Friday.

A special event of the week will come off at the Wednesday luncheon—the awarding of trophies to winners of the associations' 1949 safety contest. Kuert Concrete, Inc., South Bend, Ind., is winner in Class A, for companies producing more than 40,000 cubic yards of concrete during the one-year contest period. It had no injuries to employees or non-employees, and only one property-damage accident during that time. In Class B (40,000 cubic yards or less), Modahl & Scott, Inc., of Bloomington, Ill., came off top with an accident-free record.

Eight other companies in the smaller-plant competition also had accident-free records: Builders Concrete, Inc., Muncie, Ind.; The Trumbower Co., Nazareth, Pa.; Mesaba Construction Co., Hibbing, Minn.; Randecker Brothers Co., Lock Haven, Pa.; Wolf Ready-Mixed Concrete Co., Logansport, Ind.; Grand Junction Building Materials Co., Grand Junction, Colo.; Grand Haven Ready-Mix Concrete Co., Grand Haven, Mich.; and Portland Sand & Gravel Co., Portland, Pa. Of these, Trumbower, Mesaba, and Grand Haven have had accident-free records for two consecutive years, and Grand Junction has maintained an accident-free record for three consecutive years.

Manual on Automotive Electrical Equipment

A comprehensive maintenance and operation manual for automotive electrical equipment is now available from the Electric Auto-Lite Co., of Toledo 1, Ohio. The 218-page color manual explains the make-up of each of the seven basic electrical circuits on an automobile and how to service the parts comprising each circuit. It points out that the information on one or more of these seven circuits would apply equally well to truck, tractor, marine, and industrial engines, and variations due to the use of different electrical equipment are covered.

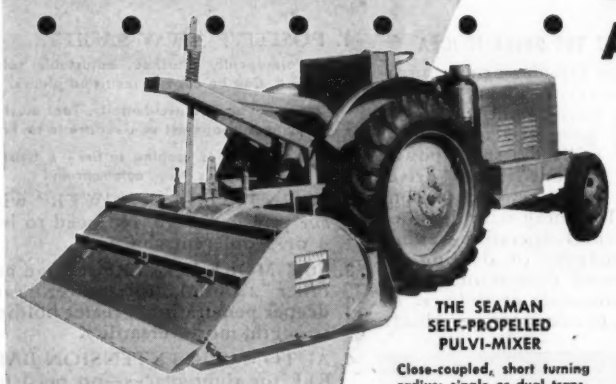
The manual considers the electrical system as a combination of circuits rather than a collection of individual electrical units. It opens with a complete automobile wiring diagram and then explains each of the seven circuits —starting, charging, ignition, horn, windshield wiper, instrument, and lighting. The final chapter covers maintenance and trouble-shooting.

The manual, as an Auto-Lite publication, applies to Auto-Lite units, and the test specifications, adjustment, etc., cannot be applied to units of other manufacturers. The general information, however, is applicable for all installations.

The price per copy is $1.75 plus postage, and the booklet can be secured by addressing the Parts and Service Division of The Electric Auto-Lite Co.

The New SEAMAN MIXER

THE PRIMARY EQUIPMENT FOR ALL MAJOR BITUMINOUS, SOIL-CEMENT AND ALL SOIL-STABILIZED Projects!



THE SEAMAN SELF-PROPELLED PULVI-MIXER

Close-coupled, short turning radius; single or dual transmission gives 3 to 7 mixing forward speeds plus road-gear and reverse. Wide visibility for operator. All controls in instant reach.

THE SEAMAN SELF-PROPELLED TRAV-L-PLANT

All the advantages of Self-Propelled Pulvi-Mixer plus spray bar, pump, pump tachometer and tachometer wheel for accurate, no-migrating, no-evaporating admixture of bitumen or water most efficiently just ahead of rotor. Single or dual transmission, like Self-Propelled Mixer gives mixing speeds to match all conditions.

THE SEAMAN PULL-TYPE PULVI-MIXER

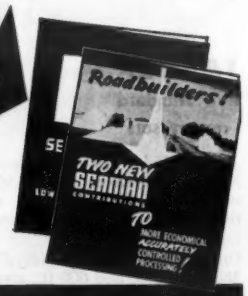
Here selective speed transmission controls rotor-speed to obtain best mixing despite variables in speed of towing tractors. Can easily be equipped with spray bar, pump and tachometer wheel for bitumen or water taken from transfer or tank truck.

Yes, — large *projects* that have been handled by states, municipalities, counties and contractors such as these, — where *all* mixing was SEAMAN-produced: Andrew Scherer, contractor, N. C. (soil-cement); Davis Construction Co., contractor, N. Y. (bituminous); Standard Concrete Pipe Co., Cal. (Soil-cement); Cascade County, Montana (re-claiming oil mat); City of Birmingham, Mich. (asphalt); State of North Carolina . . . check with any or all of them about high production and fine quality mixing by the SEAMAN.

In short, the SEAMAN brings "plant-mix quality at *lowest* road-mix cost."

These new quality-mixing records are due to selective speed transmissions that match mixing speeds exactly to materials.

TWO NEW BULLETINS!
One on the Seaman Self-Propelled Mixer and Trav-L-Plant—the other on the Seaman Pull-Type Mixer. Yours on request. Complete details. Send for them now.



SEAMAN MOTORS, INC.
282 N. 25th St., Milwaukee 3, Wis.

Safety From Fire Begins on the Job

Welding and Salamanders Originate Many Blazes; Take Precautions and Use Approved Extinguishers

By P. C. HENSLER, Fire Protection Institute, New York City

✦ CUTTING a $700,000,000 path of destruction across the country, fire last year made an unwelcome visit to 570,000 American buildings. Grimmer than this startling material loss was the death of approximately 11,000 men, women, and children—an average of 30 deaths per day, more than one death every hour.

Take Precautions

Destructive fires and blazes occur often in the process of construction. Temporary job buildings, put up hurriedly and sometimes haphazardly to house blueprints, time sheets, and other records, can spark disastrous fires because of improper wiring and defective heating apparatus. The job site itself can harbor many potential hazards. Contractors can start themselves on the road of safe construction by seeing to it that all accumulations of brush, trees, rubbish, and debris are piled in orderly bundles for early removal.

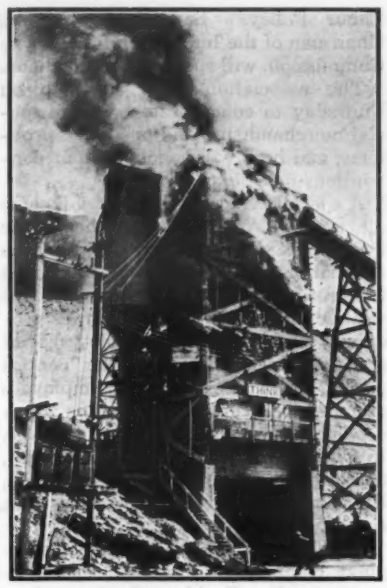
Normal building operations necessitate large quantities of highly combustible materials—forms, scaffolding, and canvas. During the first stages of each job, a fire warden can be picked to be responsible for enforcing common-sense rules of fire safety, as well as an adequate number of watchmen fully trained and equipped to deal with emergency. Added protection can be provided by placing Underwriters'-approved fire extinguishers throughout the job area.

The Factory Mutual Insurance Cos. assert that two-thirds of construction fires originate in welding or cutting operations and in salamanders. Most fires start from drops of hot slag or white-hot metal which can retain their heat for some time. These fires may smoulder for hours before becoming apparent, and often burst into flame when no one is present. In some cases, fires may start when the flame of a welding torch ignites flammable liquids or rubbish near by.

Salamanders used on construction projects are often made of old metal drums punched with holes. Because there are so many combustibles around them, they present a real hazard. It is advisable to use coal or coke for fuel because of the spark hazard involved in the use of wood.

It is wise to prohibit smoking in the vicinity of combustible materials, and to keep them in constant surveillance. Workers engaged in welding or cutting should be adequately protected by wearing woolen clothing, hats, high safety shoes, and goggles. These simple precautions may save the worker many hours of lost time and much money involved in on-the-job accidents.

Losses are also likely to occur from the use of untreated scaffolding or ordinary canvas tarpaulins. Metal scaffolding and flameproofed canvas are available; in fact, building codes often require them.



This mixing-plant fire cost the contractor both time and money.

As work progresses, it is important to provide permanent stairways, stairway enclosures, and other structures to prevent the horizontal or vertical spread of fires. Permanent wiring systems should replace temporary ones as soon as practicable. And permanent heating plants or temporary unit heating systems can often take the place of salamanders that are dangerous.

If Fire Breaks Out

Fire-safety experts report that the first 5 minutes spent in fighting a fire are the most important. Therefore, employees should thoroughly understand how to use the fire-fighting equipment on the premises. Minutes spent reading instructions in time of emergency can often mean the difference between a controlled fire and complete destruction.

More and more contractors are recognizing the worth of employee fire

(*Concluded on next page*)

4 days' work now done in 3

with JAEGER "new standard" compressors

Jaeger Model 125 runs 2 heavy duty or 3 medium breakers at full 90 lbs. pressure, doing 30% to 40% more work than at 70 lbs. pressure from a 105 ft. machine.

Other Jaeger "new standard" sizes, 75, 185, 250, 365, and 600 ft., give you comparable work increases. Cost no more than smaller old sizes. Send for Catalog and prices.

THE JAEGER MACHINE CO.
Columbus 16, Ohio

GREAT NEWS FOR CONTRACTORS...

THE POWDER-ACTUATED FASTENING TOOL *Comes of Age*

After Months of Laboratory Experimentation... After Thorough "On-the-Job" Testing... We Proudly Present the New and Amazing DRIVE-IT "300" the Powder-Actuated Fastening Tool Our Customers Asked For.

THE BIRTH OF THE DRIVE-IT IDEA

Three years ago Powder Power introduced the most revolutionary and efficient fastening method known. It was the DRIVE-IT powder-actuated tool . . . a tool that utilized a small power charge and a hardened steel "drive-pin" to fasten steel or wood to concrete or steel. Fastening with this tool was a split-second operation—eliminating the drudgery of drilling or hammering—saved contractors hours of time and thousands of dollars. In short, it was a bonanza for everybody

who had a steel or wood to concrete fastening problem. Thousands bought DRIVE-IT tools and letters of praise for their money-saving effectiveness flooded in.

PRESENTING . . . THE NEW DRIVE-IT "300"

Months ago our engineers went to work to design an *entirely new* and *better* powder-actuated tool . . . one which would embody all of the features our customers asked for. The result is the DRIVE-IT "300".

Here it is . . . it's ready for you NOW. Check these features and you'll realize why we say: "The new DRIVE-IT "300" is the *only* truly modern, efficient and *safe* powder-actuated tool on the market!"

1. POSITIVE 3-WAY SAFETY.
   1. Permanently attached, adjustable safety pad. Can be used in restricted places.
   2. Cannot be fired accidentally. Tool must be depressed against *solid surface* to be fired.
   3. No hitting or lunging to fire—a twist of the wrist does it . . . *automatically!*
2. "CONTROLLED POWER" with *one* power charge. No need to buy 4 or 5 different charges.
3. 40% MORE POWERFUL than any other "22" tool. More power means deeper penetration, greater holding strength, more versatility.
4. AUTOMATIC EXTENSION BARREL for tight places—no need for extra, expensive extension barrels.
5. LIGHTWEIGHT. Tool weighs only 5 lbs. 10 ozs. Makes overhead work easy. Can use for hours without tiring effects.
6. LESS NOISE. Tool is much quieter in operation—easy on the nerves.
7. FLANGELESS DRIVE PINS. Easier to handle—cheaper to buy. No "ring" to dig out of tool after firing. No area exposed to corrosion on plated pins after driving.

There it is, mister! A powder actuated tool with the "bugs" out. One that can save you up to 75% in fastening costs and *still* keep your workers happy. Do yourself a favor and send for the whole story *today!*

DON'T DRILL IT... DRIVE-IT POWDER-POWER TOOL

Distributors Coast-to-Coast

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Sure I'm interested... Send me the story! Quick!

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brigades. The basic objectives of a fire-brigade program include: training personnel in sound fire-prevention habits; familiarizing personnel with approved fire-fighting equipment and how to use it; minimizing panic in the event of fire by assigning specific responsibilities to brigade members; and encouraging excellence in brigade performance through continuing programs of inter-brigade competition.

But despite the proved value of brigades, Rule No. 1 is to call the fire department at once.

Added precautions are necessary to protect projects remote from public fire departments. It is sometimes assumed that the water supply used for concrete mixing is adequate for fire-fighting purposes. But unless the water is supplied from permanent mains and hydrants, with adequate pressure for emergencies, these facilities do not guarantee control of serious fires.

Failure to use the proper type of extinguishers in fighting a fire may be disastrous. Here are the ABC's of extinguishing fires:

(1) *For Class A fires*—wood, paper, cloth, rubbish, and other combustible materials—use approved foam or soda-acid extinguishers.

(2) *For Class B fires*—oil, grease, paint, and related products—use approved foam, dry-chemical, vaporizing-liquid, or carbon-dioxide extinguishers. Do not throw water on this type of fire; it spreads the flames.

(3) *For Class C fires*—electrical installations, including motors and generators—use approved carbon-dioxide, dry-chemical, or vaporizing-liquid extinguishers. Do not use a water-type extinguisher on electrical fires.

Fires Can Be Prevented

Fire-safety experts say that 90 per cent of all fires can be prevented. With all the construction going on in this country now, it is important that fire safety begin on the job. Be prepared for fire. Back your fire-prevention measures with adequate Underwriters'-approved fire-fighting equipment, and the knowledge of its use.

Fire can strike anywhere—any time! You can save yourself dollars, manpower, and time by being always prepared.

Plant-Mix-Asphalt Booklet

A 20-page booklet on asphalt paving of the plant-mix type is offered by The Texas Co., 135 E. 42nd St., New York 17, N. Y. It covers sheet-asphalt, sand-asphalt, and asphaltic-concrete pavements. In the latter category it treats the hot-mix hot-laid type, the hot-mix cold-laid type using asphalt cement, the cold-laid type using asphalt surfacing materials, and the cold-laid type using emulsified asphalt.

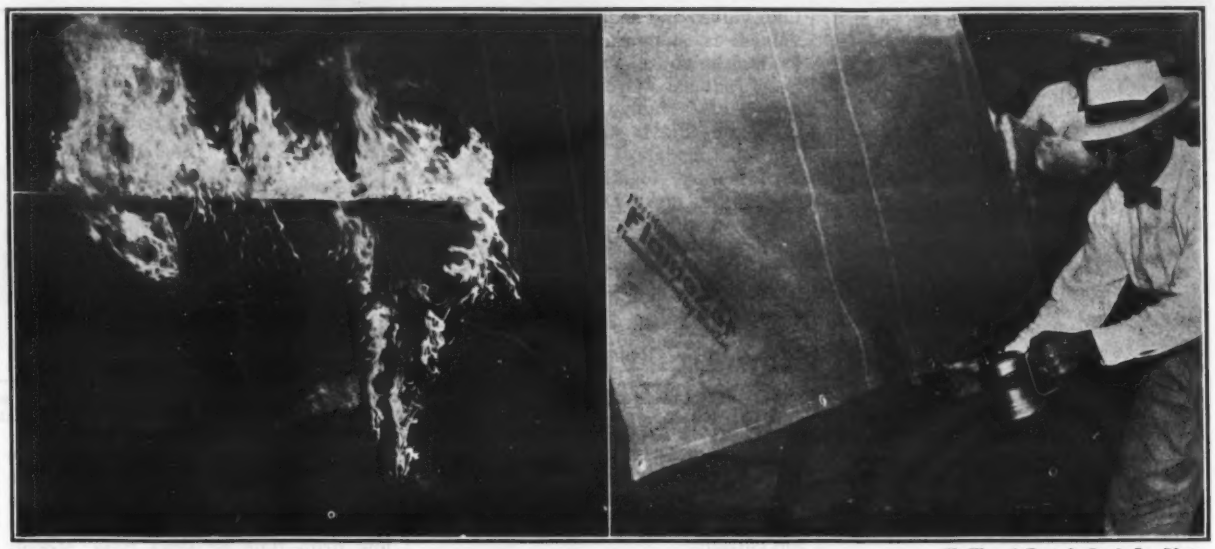
A complete step-by-step description of the procedure followed in mixing and laying plant-mixed pavement is given in the booklet. A full list of Texaco asphaltic products and their uses is also included; it describes products used in asphalt construction and maintenance by the pressure-distributor method, as well as products for the plant-mix types of asphalt construction.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 50.

Changes for A. O. Smith

The A. O. Smith Corp., Milwaukee, Wis., announces that sales activities for its welding electrodes and equipment will henceforth be directed from the Welding Electrode & Equipment Division in Milwaukee instead of the North Central District in Chicago. This move brings sales and technical service to customers closer to the Smith research and production facilities.

J. T. Pritchard, Manager of the Milwaukee Division, will supervise sales activities for these products, and L. F. Vonier has been appointed General Sales Manager of the Division.



H. Wenzel Tent & Duck Co. Photos

A serious winter-construction fire hazard is the possible ignition of canvas enclosures by sparks from open salamanders or welding torches. Flameproof canvas, such as the FlameKel being tested at right, is now available. It will help cut fire losses.

Style S—Standard Gyrasphere has—

1. Longer Crushing Stroke giving greater capacity.
2. Larger Roller Thrust Bearings, both now located at top of eccentric.
3. More Eccentric Bearing Area in upper crushing zone.
4. Longer Springs to pass larger tramp iron.
5. New Location of Drive Gears for more economical operation.
6. Easier Accessibility for lower maintenance.
7. Available with either coarse or medium bowl.

Style FC—Fine Crushing Gyrasphere has these additional improvements—

1. New Feed Distributor for even feeding and a more uniform product.
2. Different Shape of Mantle and Concave with longer parallel crushing zone for finer product.
3. New Gun-Lock type mantle and concave holding devices — automatically self-tightening, easier to change.
4. More Springs for greater crushing pressures.
5. Available with either medium or fine bowl.

Y-9

SMITH ENGINEERING WORKS, 4614 W. BOLTON STREET, MILWAUKEE 14, WISCONSIN

Cable Address: Sengworks, Milwaukee

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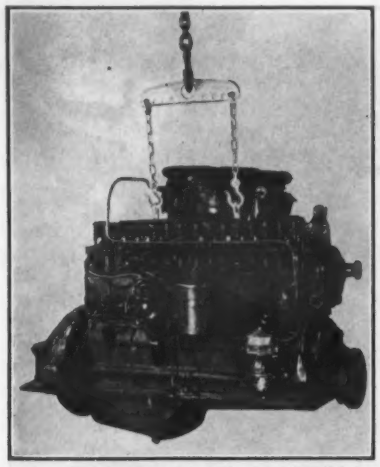
Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C. • Rish Equipment Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.



The Clayborne lift kit for handling truck or tractor engines, transmissions, and heads attaches directly to the unit being lifted through eye bolts and nuts.

Lift Kit for Engines, Heads, Transmissions

A lift kit for truck and tractor engines, transmissions, heads, etc., has been developed by Clayborne Mfg. Co., 2615 S. Michigan Ave., Chicago 60, Ill. Designed for safety above all, it attaches directly to the part being lifted through eye bolts and eye nuts, distributing and balancing the weight. Eye bolts and nuts are stamped to show safe load limits, and all parts are specially hardened and cadmium-plated.

The lift kit comes in three sizes. The 1-ton-capacity size is for lifting car and light-truck parts. The 2-ton and 5-ton sizes are for heavy truck and tractor application. Special kits for special lifting operations can be assembled.

Further information may be secured from the company, or by using the Request Card at page 16. Circle No. 42.

Truck Line Expanded

A new and expanded line of trucks comprising 356 basic models has been announced by the Dodge Division of the Chrysler Corp., Detroit 31, Mich. The company's truck line now ranges from 4,250 to 23,000 pounds gross vehicle weight and up to 40,000 pounds gross combination weight. Nominal ratings have been increased to include some 2¾ and 3½-ton models.

Among the features of the new B-2 Series are: an electrical system which helps improve engine performance, a new 5-speed synchro-shift transmission, a new 5-speed synchro-shift overdrive transmission, cyclebonded brake linings as standard equipment on all models, and a steering-column gear-shift and a convenient hand brake under the center of the cowl on ½, ¾, and 1-ton models.

Fourteen new models have been added to the 1½-ton group to broaden the coverage in that group to 92 GVW options. Dodge now offers three basic models in the 1½-ton group, ranging from 7,000 to 16,250 pounds in seven different wheelbases.

One completely new engine is among the seven offered in the new line. Engine features include the use of four piston rings with the top ring chrome-plated; exhaust-valve-seat inserts; and silchrome exhaust valves. The J and K models (2½-ton) have silchrome intake valves and sodium-cooled exhaust valves as standard equipment. Rear loading height on the three models has been reduced more than one inch by means of a change in spring contour. Cross steering is standard on all conventional models of the new B-2 Series. This feature, together with the wide front axle, gives Dodge trucks a 37-degree turning angle.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 14.

New Trailers Have 35 to 100-Ton Capacity

Newly designed multiple-axle trailers in large sizes and heavy capacities have been announced by Transport Trailers, Inc., Cedar Rapids, Iowa. Models are available in 35 through 100-ton capacity.

These trailers feature four rear axles that rock lengthwise and crosswise to permit hauling very heavy loads, as the weight is distributed evenly over the 16 tires. Decks are made in either the low drop type or level type. Models through 60-ton capacity are available 8 feet wide. Optional equipment includes side brackets to extend the width to 10 feet.

Further information may be secured from the company, or by using the Request Card at page 16. Circle No. 29.

Four rear axles that rock lengthwise and crosswise to permit hauling very heavy loads feature the new Transport trailers, which are made in 35 through 100-ton capacity.

How those watchers stare when a Whitestown Trencher's digging!

All the sidewalk superintendents will marvel at the ease with which this new trencher digs and dumps.

And when the digging is up next the curb or close to a building wall, their "Oh's" of admiration will become distinctly audible!

The *Whitestown Trencher* digs to a depth of 8 feet and dumps to a height of 12 feet or more—*with 35 to 50% greater effectiveness!*

Equipped with a ½-yard standard bucket or with a special bucket made to your specifications, and designed to fit an Allis-Chalmers HD-5G tractor with a TS-5 tracto-shovel attachment, the *Whitestown Trencher* has many uses—for watermains, sewers, cellar excavation, fuel storage tank excavations, crane work, etc.—and is *especially adapted for digging close up to a curb or wall.*

Something new has been added-

Write: WHITESTOWN TRENCHER CO., WHITESBORO, NEW YORK

Vulcan Tools

A complete line for every type of Rock Drill, Pavement Breaker and Clay Digger.

Vulcan Tool Manufacturing Co.

35-43 Liberty Street, Quincy, Mass.

Branch Offices and Warehouse Stocks.

74 Murray St. New York, N. Y. — **34 No. Clinton St. Chicago, Ill.**

The HYDRAULIC "HUSKY"

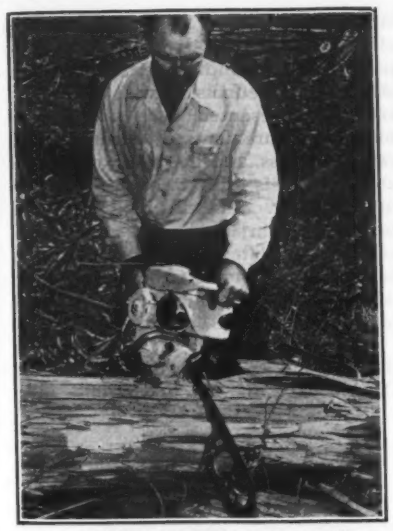
The "HUSKY" ALL-PURPOSE Road Grader, Maintainer, Ditcher and Terracer can now be supplied with Hydraulic Controls for front and rear operation.

It does such better work it is hard to believe until you try it out. Unexcelled for contractors leveling off, maintaining, ditching, filling tile trenches, etc.

So strong all parts, except tires, are guaranteed against breakage for one year regardless of why they break. Overdiring prevents skidding and washboarding. The outstanding Pull-Type.

Manufactured by

NORTHFIELD IRON COMPANY, P.O. Box 30-D, Northfield, Minn., U.S.A.



The Model 3-25 McCulloch gasoline-powered chain saw cuts through hard or soft wood. It has a 3-hp output.

Gasoline Chain Saw

A new Model 3-25 gasoline-powered chain saw has been announced by McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif. Two straight-blade models, with 18 or 24-inch blades, and a 14-inch bow saw are available.

The primary mechanical features of the saw are its 25-pound total weight and 3-hp output. Hand grips are shaped and positioned to afford easy sawing vertically or horizontally, right or left-handed. The throttle is controlled by a trigger in the pistol-grip handle. The manually operated, built-in chain oiler is operated by a thumb button just above the throttle. Next to it is the primer for starting; no choking is required. Fully automatic, it requires no clutch control. For starting, a "kick-proof" rewind starter is located near primer and throttle.

The power unit is a special McCulloch single-cylinder 2-cycle air-cooled gasoline engine, built almost entirely of magnesium-alloy die castings. The cylinder is an aluminum die casting, with a long-life cast-iron liner. The carburetor is a diaphragm type, without float. In combination with the built-in fuel pump, this permits use of the saw in all angles and positions.

The power unit is used without modification on all three models of saw. It is a simple operation to change from bow to straight blade or vice versa, according to the manufacturer. When cutting attachments are being changed, chain tension is adjusted automatically. Various chains are available for cutting in all types of soft, hard, or frozen wood.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 23.

Open Roads in Winter

Two catalogs on snow-removal equipment are now available from the J. D. Adams Mfg. Co., 217 S. Belmont Ave., Indianapolis, Ind. They feature rotary snow plows, V-plows, and snow wings for use with Adams motor graders.

The first catalog illustrates and describes the Adams No. 6 V-type snow plow, which has an 8-foot 6-inch cutting width and a 6-foot 2-inch height. When the plow is used without wings, it is operated by the control ordinarily used by the scarifier. The cut may be widened by using the 10 or 12-foot No. 22, Adams snow wings. When both plow and wings are used, they are operated by an auxiliary power box mounted on the frame cross-beam. The box provides power for operating the plow, and for the inner and outer ends of the wing, by means of two cable drums.

Principal applications for the rotary snow plow are indicated in the second folder: to open up drifts too deep for V-type plows; to widen cuts which other plows have made by blowing away the snow banks they have created; and to remove snow from shoulders so roadbeds will have proper drainage when the snow melts. All operating features and complete specifications for the rotary are included in the folder. This snow-fighting equipment is designed to make the Adams graders year-round equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 123.

McKiernan-Terry Director And Vice President Dies

William F. Campbell, Vice President and Director of McKiernan-Terry Corp., died suddenly on November 19. He had been associated with the National Hoisting Engine Co. and the McKiernan-Terry Corp. for over 30 years in the manufacture of hoisting machinery, pile hammers, and special machinery.

SYMONS FORMS · SHORES · COLUMN CLAMPS *Doing a Good Job -*

AN EASY WAY

FORMS—Cut labor costs 50%. Only three pieces of hardware—bolt, wedge, form tie. Tie remains in the concrete, bolt and wedge may be reused. Bolt holds the forms together and holds the ties both ways. No nails or spreaders. To strip forms take out wedges, remove bolts, then pull forms up or out. Ties break back inside the wall 1" from the surface. Made up ready for use or you may purchase the hardware for building your own forms.

SAFETY SHORE—Lighter, stronger, easier to adjust and safer to use. Symons Shore has these exclusive features . . . metal scab, powerful lifting jack, simple and secure tee head and an extension for very high ceilings. Compare the Symons Shore with other shores and you will be convinced of its superiority.

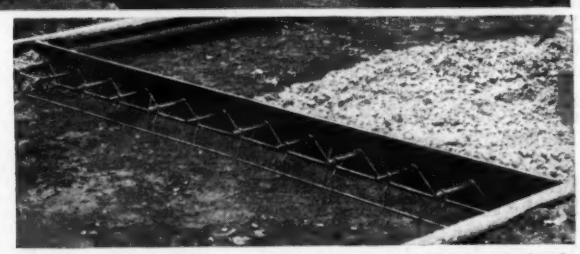
COLUMN CLAMP—Has only two units—both alike. There are no loose parts. Simple to put on—only tool required is a hammer. Symons Clamp is the only clamp known that will positively square up the column. Completely adjustable.

Symons Forms, Safety Shores and Column Clamps can be rented with purchase option. Write today for your Catalogs on Symons Forms, Safety Shores, Column Clamps and Accessories.

SYMONS CLAMP & MFG. CO.

4251 WEST DIVERSEY AVENUE • CHICAGO 39, ILLINOIS

One of four concrete bridges built for the new road. Bethlehem supplied the reinforcing steel.

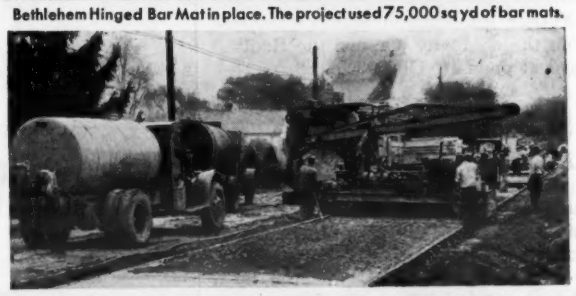


Bethlehem Dowel Unit, fitted with full-depth contraction plate, awaits batch.

Road Construction Near Lancaster, Pa.

Approximately five miles of Pennsylvania's Route 23, popular highway carrying local traffic between Lancaster and Philadelphia through Phoenixville, underwent reconstruction recently in the Lancaster area. Various phases of the two-lane, four-bridge project are shown in the accompanying pictures. Contractor: C. W. Good, Inc., Lancaster. Bridge reinforcing, bar mats and dowel units were supplied by Bethlehem.

Bethlehem Hinged Bar Mat in place. The project used 75,000 sq yd of bar mats.



With the screed virtually on heels of skip, paving proceeds at lively pace.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

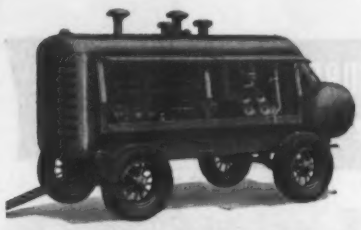
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand
Pipe • Hollow Drill Steel • Spikes • Bolts and Nuts
Tie-Rods • Timber Bridge Hardware
Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL

Men in charge of the project take time out to pose for photographer. From left to right: Harry Henry, inspector, Pa. Dept. of Highways; Zeplan Lee, foreman, and John Long, superintendent for C. W. Good, Inc.; E. D. Colling, project engineer, and Thomas Jones and H. J. Koutris, inspectors, Pa. Dept. of Highways.



The portable IKA-500 air compressor is diesel-driven and delivers 500 cfm at rated 100-psi pressure.

New Air Compressor Is Diesel-Powered

A new diesel-driven 500-cfm portable air compressor, the IKA-500 Mobil-Air, has been announced by the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. Its International-Harvester heavy-duty UD-24 engine starts as a low-compression gasoline engine and after a short warm-up period is shifted to full diesel operation by means of a single lever.

This two-stage air-cooled portable compressor has all the features of Ingersoll-Rand's KA-Series Mobil-Air compressors in sizes from 105 to 500 cfm. The floating-speed regulator is designed to slow down the compressor to the lowest practical working speed that compresses just enough air to hold the pressure. Full 500-cfm capacity is delivered at rated 100-psi pressure. Other features include Hydro-Shift Flex-Disc clutch, channel valves, and sturdy running gear and mountings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 13.

For Safer Operations Around Power Lines

A newly designed safety warning device to prevent accidents in congested work areas around power lines has recently been offered by Electro-Alarm Sales Co., Dept. 17, 320 WOW Bldg., Omaha 2, Nebr. The Electro-Alarm proximity warning device, set on any rig, sounds a loud warning signal each time the boom swings into the vicinity of danger. The electronic system used is doubly protected from internal or external breakdowns and indicates any failure by flashing a red light in front of the operator.

Operation is simple; once turned on, the device works automatically yet allows manual control of proximity. At 75 feet it can detect and warn the operator of danger in the 10,000-volt range, according to the manufacturer. It is, the company says, sensitive to voltages from 110 up and allows proximity warnings from 4 to 200 feet. Weather conditions, Electro-Alarm states, will not interfere with its use. It is particularly useful for night work or where power lines are between the operator and the sun.

Futher information may be secured from the company. Or use the Request Card at page 16. Circle No. 68.

Concrete Vibrators

A circular covering the Messenger concrete vibrators—including heavy-duty, jack-shaft, and light direct-drive units—is offered by Frank D. Messenger, P. O. Box 124, Fair Haven, Mich. The Model AKS, powered by a 4-hp air-cooled Wisconsin engine with an automatic clutch, is featured in the bulletin. Its 7/16-inch flexible shaft has a vibrating speed of 8,000 rpm. The vibrating head, 2⅜ inches in diameter x 18½ inches long, has two single rows of antifriction ball bearings at each end of the rotor shaft. All data and specifications for this model are given along with illustrations.

Further information may be secured the company, or by using the Request Card at page 16. Circle No. 34.

Building Insulation For Roof and Floor

Poretherm, a lightweight high-grade insulation for roof and floor construction, is a recent development of the Porete Mfg. Co., Porete Ave., North Arlington, N. J. Poretherm is made solely of Portland cement, with air bubbles introduced into the mix by the use of a stabilized foam produced in a small foam machine. The result is a neat-cement cellular concrete.

Weighing 30 pounds per cubic foot, this product is said to have a compressive strength of 150 psi and a thermal conductivity K factor of 0.60 Btu. Poretherm may be used as an insulating fill 2 to 6 inches thick, poured in place on concrete, gypsum, wood, or steel decks. It is said to be permanent, moisture-proof, and non-combustible.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 44.

Treating Carbon Steel With Hardening Compound

A technical report on treating carbon steel with the activated carbon-chromium hardening compound Hi-Speed-It is available from Wilson Carbon Co., Inc., 60 E. 42nd St., New York 17, N. Y. Bulletin No. 11 covers a study of the effects of Hi-Speed-It hardening compound on the simplest form of carbon steel, so that effects as well as results could be presented in a progressive form. Measurements of hardness and case thickness, and the result of tensile and bend tests after treating are given in the folder. The effects of time and temperature in the heat-treating process are correlated by the author. This is the first of a series of bulletins which will analyze the treatment of tools and machinery.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 108.

AASHO Committee Reports

The 1948 proceedings of the American Association of State Highway Officials have been published in a limited edition by the Association. This edition covers committee activities in connection with the Salt Lake City meeting in September, 1948, and contains all of the papers presented at that meeting. Since these papers cover the entire range of present highway problems, the book is considered by the AASHO to be an important addition to engineering libraries.

As long as the supply lasts, copies may be obtained by writing to the AASHO, 1220 National Press Bldg., Washington 4, D. C. The price per copy is $4.00.

Break-A-Way Couplers

A circular describing the Ulrix hydraulic Break-A-Way coupler, which is designed to break and seal both ends of the line automatically, has been issued by the Ulrich Mfg. Co. of Roanoke, Ill. The bulletin points out that when hydraulically-operated equipment becomes separated from the tractor, the chain link on the coupler automatically breaks the line connection by pulling back the sleeve release. Sphere valves seal both ends of the line automatically to prevent loss of hydraulic fluid.

Data on construction, available sizes, and applications are included. The circular also lists the installation instructions for these couplers. Illustrations of the coupler, joined and broken, are shown.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 107.

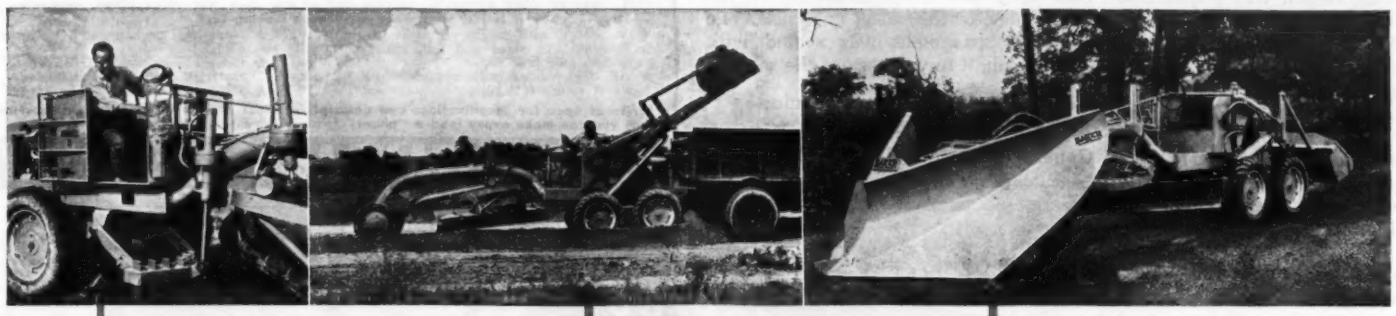
Circular on Chain Saw

A circular describing the Model DJ Hornet chain saw is available from the Southern Distributing Co., Front and Central Ave., Cincinnati 2, Ohio. It explains that the saw weighs 30 pounds, has a 16-inch cutting length, and is designed to cut all woods.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 118.

L. A. Warehouse Moves

The west-coast factory warehouse of Hose Accessories Co., Philadelphia manufacturer of hose couplings, is now located at 1320 Santa Fe Ave., Los Angeles 21, Calif. It carries a complete stock of Le-Hi hose couplings, clamps, nipples, and related accessories.



HYDRAULIC SCARIFIER—does a surprising job ...rear-end weight keeps teeth ripping uniformly, at desired depth—smooth, positive steering.

LOADS MATERIAL into trucks with Tractomotive Loader—from windrows and stockpiles...surplus dirt or snow.

PLOWS SNOW with specially designed Baker snowplow (backfills with interchangeable blade).

One-third the price of large motor graders

Yet has many big grader features — Tandem Drive, "Roll-Away" Moldboard, Tubular Frame, Hydraulic Blade Lift, Engine Over Drive Wheels, Drop Down Transmission, High Throat Clearance, Complete Operator Comfort, Full Visibility, Simplified Servicing . . . . . Plus special attachments that widen its usefulness—Rear-End Loader, Scarifier, V-Type Snowplow with interchangeable blade for backfilling and light 'dozer work. Also various other accessories.

Ask your Allis-Chalmers dealer for a demonstration.

ENGINEERED FROM THE GROUND UP— to bring you BIG grader design and performance advantages

MAINTAINS DIRT AND GRAVEL ROADS AND STREETS, CUTS SOD FROM SHOULDERS, HANDLES LIGHT CONSTRUCTION

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Road-Mix Project Longest in State

54-Mile Contract Mixed and Laid in Less Than 2 Months As Fast Crews Whip Distance As Well As Time

✦ A ROAD-MIX paving project 54.2 miles long, the longest single job ever done by contract in the state of Nevada, was finished in less than 2 months. The unusual paving record was established by Dodge Construction Co. of Fallon under a $236,777 Federal-Aid Secondary contract with the Nevada Department of Highways.

Located on State Route 8A, the project started about 50 miles north of Tonopah, and extended northerly to a junction with U. S. 50. A short 2.7-mile stub, extending in to the mining center of Round Mountain, was included in the work.

Completion of the project now makes Route 8A available as a fast north-south short cut between the widely spaced towns of western and central Nevada. The project replaces an ancient county road, which followed for 50 years or more the present general location.

The Dodge Construction Co. contract included road-mix surfacing, and the installation of 29,600 tons of crushed-gravel sub-base and mineral aggregate on a 20-mile section. The 20-mile piece which required crushed rock was built in 1947 by the same contractor. A 30-mile section was also built, mostly through the fall and winter of 1948-49, by Silver State Construction Co. It was completed, including mineral filler for the road-mix.

The project is generally straight. It lies in wild, remote terrain. Prior to the construction of the new secondary highway, a trip between Tonopah and Austin over the old route was a real adventure. It was such a rough trail that deer hunters, who normally are not too fussy about what roads they use, shied away from this one.

Today the casual motorist would never guess that such a condition had existed, because the new highway is silky-smooth at 70 miles an hour or faster.

Paving Laid on Sub-Base Course

The road-mix paving was laid on a select blanket of sub-base, made from crushed rock 1 inch and smaller in size. The crushed sub-base averaged 6 inches in thickness. It was produced by portable crushing and screening plants under the previous contracts. Approximately 10 pits, which lay along the new highway, furnished the select material.

The new roadbed is slightly higher than the surrounding terrain. It is well drained, and fitted with pipe culverts where natural watercourses intersect the highway. The new pavement is 24 feet wide and 2 inches thick. The gravel shoulders on each side of the pavement are practically negligible, but in any case they are a continuation, to the ditch lines, of the select sub-base. The road-mix pavement was sealed with MC-2 asphalt to waterproof the section.

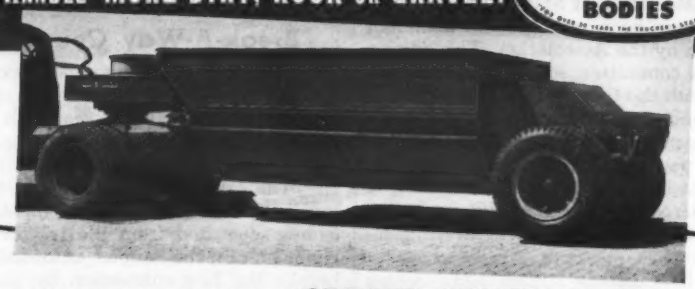
A Triumph of Organization

Today, after the job has been finished, General Superintendent L. C. Mackay

(*Continued on next page*)

HERE'S A FASTER, EASIER, CHEAPER WAY TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA STANDARD BODIES



The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . *Custom Built* to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, *quickly and at low cost*, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge, axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
★ Dumping mechanism FOOL-proof — trouble-FREE!
★ Release on doors INSTANT, shock-proof, protected from material flow.
★ Meter control that can be *pre-set*.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today—

OMAHA STANDARD FACTORY & MAIN OFFICE 2411 West Broadway Council Bluffs, Iowa

Now you can get LIMA

DEPENDABILITY and STAMINA

plus the MOBILITY of Rubber Mounting

Wheel-Mounted "Paymaster"
- Convertible Crane, Shovel, Dragline or Pull Shovel
- Powered by one engine
- One Operator Control — including travel
- Crane Capacity 20 tons (with outriggers)
- Shovel Capacity ¾ or 1 yard
- Travel Speed (maximum) 8.24 M.P.H.

Truck-Mounted "Paymaster"
- Convertible Crane, Shovel, Dragline or Pull Shovel
- Separate engine for travel
- Requires two operators
- Crane Capacity 20 tons (with outriggers)
- Shovel Capacity ¾ or 1 yard
- Travel Speed (maximum) 31 M.P.H.

Wheel-Mounted Crane or Clamshell
- Powered by one engine
- One Operator Control, including travel
- Crane Capacity . . . 35 tons (with outriggers)
- Travel Speed (maximum) 5.27 M.P.H.

With these three rubber-mounted units you can now get all the other advantages of LIMA equipment — greater performance, less "down-time", longer life, etc.—*plus* the added benefits of greater mobility, less travel time, and better maneuverability. Rotating assemblies have the same basic features as corresponding crawler machines, with alterations adapting them to truck or wheel mounting. With outriggers supported, they provide extra capacity. They are ideal for operations requiring constant movement around the job, for small scattered jobs, or jobs remotely located.

THE LIMA LINE NOW INCLUDES:

Crawler-Mounted	Rubber-Mounted
Shovels, ¾ to 6 yds.	Shovels, ¾ and 1 yd.
Cranes, to 110 tons	Cranes, to 35 tons
Draglines, variable	Draglines, variable

It will pay you to consult your nearest LIMA Sales Office or Representative before you buy your next shovel, crane or dragline. Offices in principal cities of the world.

Lima Shovel and Crane Division
LIMA, OHIO
OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

LIMA HAMILTON CORPORATION

DEEP TAMPING

MODEL TMH CONVERTED

Where specifications show a necessity of over 90% compaction on backfill tamping, R.P.B. equipment has the power and reach to do the job rapidly and permanently.

We also manufacture the MIGHTY MIDGET, a light machine driven by a 160 C.F.M. Compressor, which has proven itself very economical for breaking and tamping.

Write for Information to Department "C".

R.P.B. CORPORATION
2751 EAST 11th STREET - LOS ANGELES, CALIFORNIA

says that his principal problem "was the shift from 4 a.m. until 8 p.m.". The average superintendent, confronted with the problems of distance which Mackay faced, would soon understand and appreciate what Dodge's Superintendent was talking about.

Somehow or other a full crew had to be supplied far out in this remote country. The most complicated problem of all was the arrangement of asphalt shipments. They had to come all the way from southern California—400 miles—and arrive on a precision schedule. A great deal of the credit for that accomplishment must go to Oilfields Trucking Co. of Bakersfield, Calif., which delivered as high as eleven 20-ton loads of asphalt at application temperature in one day.

The continuous operation of road-mixing and laying machines was also a source of concern, but as it turned out, down time was negligible. The proper timing of crews, asphalt shipments, and machines was Mackay's greatest responsibility. How well he met it can best be told by giving performance records. The 54-mile paving project began on June 2, and finished on the following July 18. On one record day the laydown grader placed 157 stations of surfacing!

Mixing Follows Regular Pattern

With the possible exception of minor variation in the type and fineness of the mineral filler, there was little deviation in the road-mix process throughout the period of activity. While this difference in material caused a variation of from 1.32 to 1.70 gallons of asphalt per square yard, the mixing steps were kept practically constant.

Sections from 8,000 to 10,000 feet long were worked at one time. The mineral filler for a section was either hauled, in the 20 miles where it was missing, or scraped up off the surface, where it had previously been placed, by a No. 12 Caterpillar motor grader. The weather was beautiful the whole time, and the material lay powder-dry in the wind and sunshine.

The windrow was laid initially on the quarter point, on the west side of the highway. Planned for a finished pavement thickness of 2 inches, it contained 5.2 cubic feet per linear foot. This was checked quite carefully by inspectors under Resident Engineer E. G. Scoggin.

The road-mix operation proper began each morning at 4 a.m., when the big Kenworth transports arrived from their long 400-mile one-way trip from Los Angeles. Each unit hauled approximately 20 tons of SC-3 asphalt at a trip. The asphalt came from the Clearwater, Calif., refineries of Douglas Oil Co., and arrived on the project at its application temperature of from 250 to 280 degrees F.

Waiting to receive the bitumen was a Gardner road mixer, which was used to mix the entire 54-mile project. The hours of 4 to 8 a.m. and 3 to 7 p.m. were designated as unloading times. By holding strictly to that schedule, a better synchronization of asphalt tanker shipments was maintained, and the other machines also had ample time to lay down what had been mixed.

The entire asphalt content was put into the windrow by the first pass of the Gardner road mixer. During this trip the windrow was in its initial quarter-point position. A Caterpillar No. 12 motor grader followed the mixer very closely, and healed up the windrow behind the machine, so that it would get some additional mixing and be ready for further work by the Gardner.

The second pass with the Gardner machine was then made. After this pass, the motor grader gave the material one complete roll, laying the windrow in the approximate center of the highway.

The Gardner machine then worked on the windrow until thorough and intimate blending of asphalt and mineral filler had been accomplished. This often took from 2 to 3 additional passes. A few stubborn sections, where some crushed lime rock was found, required a maximum of 7 road-mixer passes. During this final mixing, no more blading by the graders was necessary.

During the interim, while this was being done, surveyors were busy setting the edge-of-pavement, or collar-line, stakes. The grade was bladed clean, preparatory to the initial laydown.

The mixed windrow of material was laid down by cutting the first section off to the east side of the roadway. A shop-made steel wing was used at the blade edge to maintain the load of material necessary for a straight, true line. Then the other half of the material was bladed with a cut toward the west edge.

The material was then all brought back to the center, with the thought in mind that this process would give additional mixing and a better gradation of particles. With the windrow again in the center of the highway, the material was re-bladed out to the pavement

(*Concluded on next page*)

THE NEW B-60
(60 lb.)
PAVING BREAKER

- Hard Hitting—equals most 80-lb. tools
- More work—Less operator fatigue
- Smooth operating
- Positive action ball valve
- Low air consumption
- Built-in oil reservoir
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Hardsocg Paving Breakers are made in three sizes—including B-80 & B-35

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(Note the full Buckets)

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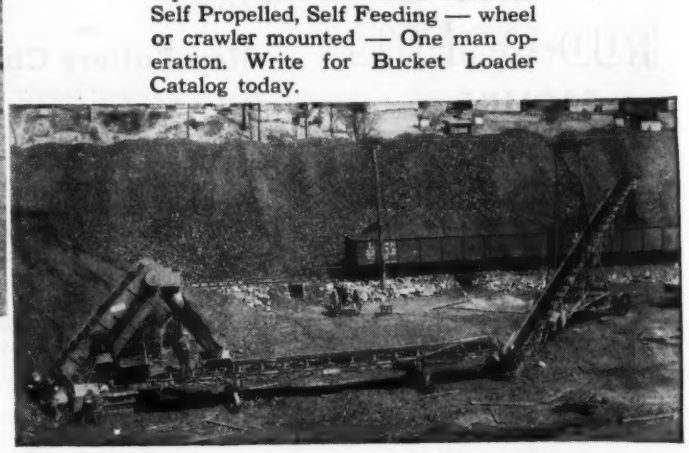
Load 3 To 8 Yards Per Minute

Haiss Bucket Loaders are used for excavating — rehandling — stripping and loading: sand — gravel — stone top-soil — coal and similar materials. Self Propelled, Self Feeding — wheel or crawler mounted — One man operation. Write for Bucket Loader Catalog today.



HAISS LOADER and Conveyors Combination

CONVEYORS portable or stationary

HAISS FLAT or TROUGH BELT CONVEYORS
(Model 481 and 482)
For all bulk materials. Mounted on "V" or mast truck with swivel wheels. Ask for Bulletin No. 481 for coal or coke handling—Bulletin No. 482 for sand and gravel, etc.

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HAISS CAR UNLOADERS
(Models 483 and 484)
Belt and drag types for low-cost undercar unloading from hopper bottom cars. Ask for bulletin No. 483-4.

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EXCAVATING — REHANDLING

HAISS SECTIONAL CONVEYORS
Made in easily assembled sections. Portable as above or stationary as below — for handling all bulk materials — Ask for Bulletin 487.

Experienced Haiss representatives are located in all principal cities. For further information, write, phone or wire.

GEORGE HAISS MFG. CO., INC. division of **PETTIBONE MULLIKEN CORP.**
141st to 144th St. on Park Ave. NEW YORK 51, N. Y. Phone Mott Haven 9-3650
4700 W. Division St. CHICAGO 51, ILL. Phone Spaulding 2-9300

Road-Mix Project Is Longest in State

(*Continued from preceding page*)

edge. In conjunction with that operation, a rubber-tired tractor and pneumatic roller started to work to give the mixture its initial compaction.

After sweeping material out to both pavement edges, the motor grader finished off the center, with the pneumatic roller quite busy right behind the machine.

The section, after being finished true to grade by the grader, was then blanket-rolled by a 12 to 14-ton Buffalo-Springfield dual-axle tandem roller, and left to set overnight. Final rolling was done next day by the Buffalo-Springfield machine. Rolling was one of the most ticklish problems. The job was paved from the south end toward the junction with Highway 50 to the north, which made it necessary for the heavy asphalt trucks to come in over the fresh pavement. Sometimes it required the better part of a day for the heavy roller to iron out the tire marks.

The highway was then sealed, behind the paving, by distributor trucks owned by Douglas Oil Co. The company's contract called for the asphalt to be delivered on the highway. The MC-2 seal was applied in two shots 12 feet wide, at a temperature of about 250 degrees. Sealing was generally done in the heat of the day, when the pavement was warm. The pavement was power-broomed prior to sealing.

Variations in temperature were extreme during the day, because of the high altitude through which the new highway passes. At 4 a. m. when the men showed up for work they sometimes built sagebrush fires to keep warm. By noon the sun blazed down and warmed the place up to 90 degrees and hotter.

Medium-type bituminous road-mix projects of this nature go in rapidly, and the high mileage of this type of construction in the west is currently carrying a great amount of cross-country traffic with moderate maintenance. By putting in a dense earth subgrade, and 6 inches of crushed sub-base, Nevada's highway engineers hope to eliminate much of the cause of pavement failure for years to come.

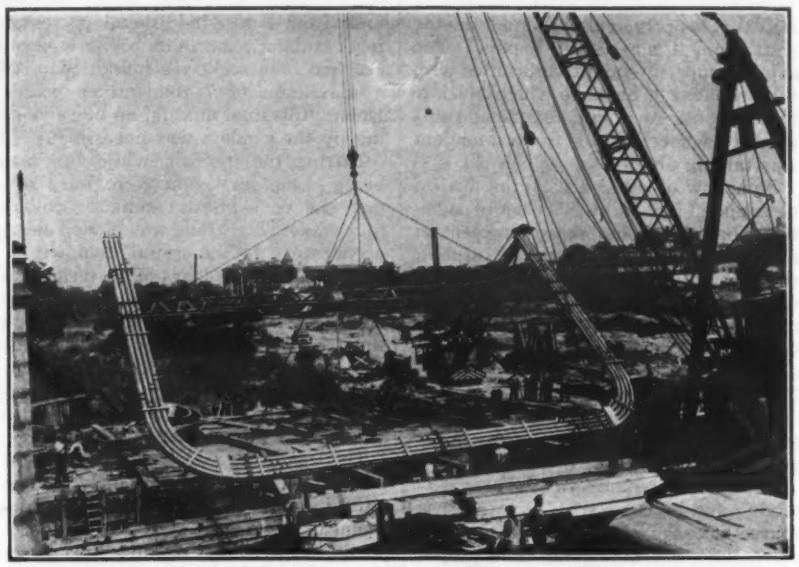
The project was designed under the supervision of W. T. "Billy" Holcomb, State Highway Engineer, and was supervised by J. D. Meacham, Construction Engineer, with E. G. Scoggin as Resident Engineer. L. C. Mackay was the General Superintendent for Dodge Construction Co., and the expert blade men who laid the material down so well were "Whitey" Cates and "Dick" Chatterton.

New Battery Charger

A new Universal battery charger for charging any type of industrial truck batteries has just been announced by Motor Generator Corp., Hobart Square, Troy, Ohio. It is designed to charge 200 to 500-ampere-hour lead-acid batteries of 12, 15, 16, and 18-cell capacity, and/or 150 to 450-ampere-hour nickel-iron batteries of 20, 24, and 30-cell capacity.

The unit consists of a separately excited motor generator set with a no-load voltage control of 30 to 60 volts, plus a voltage-drop control. The no-load voltage control is calibrated for the different cell combinations of the batteries to be charged.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 69.



On the Unionport Bridge project a conduit assembly is moved into position between the old and new bridges by derrick barge. Reinforcement consists of a 4-ton spreader made of crane-boom sections with extra angles.

Conduit Placement Features Bridge Job

The fabrication and placement of a conduit to carry power cables and telephone lines was an interesting phase of the Unionport Bridge job at Buckner Blvd., The Bronx, N. Y. The new lift bridge crosses Westchester Creek and parallels the old bridge; together the two bridges will provide two-lane traffic over the creek. The conduit will carry cables and lines under the creek bottom to eliminate the frequent breaking of cables by dragging anchors.

The conduit assembly is 75 feet wide and 40 feet high. Each of eight U-shaped conduits in the assembly consists of eight lengths of 5-inch extra-heavy galvanized Byers wrought-iron pipe welded together in coupling sleeves specially designed to close-fitting tolerances for the job.

The complete assembly consists of 13½ tons of conduit reinforced by a 4-ton spreader. It was transferred by derrick barge from the adjoining fabricating area into position across and 5 feet under the creek bottom in a 2-foot clearance between the old bridge piers and new cofferdams. The conduits were anchored in the pier caps which overhang their bases about 4 feet.

Peter V. Connolly Co. and Senior & Palmer, Inc., were the contractors, and construction was under the direction of Frederick H. Zurmuhlen, Commissioner of the Department of Public Works, New York City.

Here's Why Crane Users Save Money With

RUD-O-MATIC TAGLINE CONTROL

1. ON MAGNET PICK-UP JOBS—steel tagline cable takes the load while protective slack is maintained in costly electric cable.

2. ON CLAM SHELL BUCKET JOBS—no swing, no sway. Saves time and improves efficiency.

3. ON ALL APPLICATIONS—boom and overhead cranes. A heavy duty coil spring assures constant tension without service problems.

Large bearing and fewer sheaves reduce friction and wear.

Easy installation and easy switch to equipment of similar size.

RUD-O-MATIC COMBINATION MAGNET REEL-TAGLINE

Available in five sizes for boom crane use and 4 sizes for overhead crane application. Used by steel mills, foundries, shipyards, railway shops and scrap dealers.

RUD-O-MATIC TAGLINE

Available in 8 models to provide proper tension and sufficient cable pull out for various size buckets. Used as standard equipment by all leading crane manufacturers.

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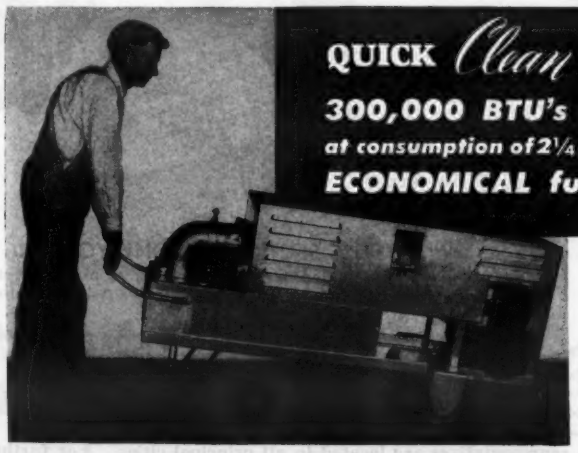

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1600 CFM at temperatures up to 300°

Powerful Blower throws an unconfined air stream over 40 feet!

HERE is the amazing new HY-LO "HOTSHOT"

FORCED-AIR PORTABLE HEATER for space heating, spot heating, pre-heating, thawing, ventilating, curing, drying, etc. For construction and industrial jobs it is "Profit Insurance" against work stoppage in winter operations. If you need heat you should know about this economical, new, low-cost heater! Dealers throughout the country. Write for literature now!

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WEDGE BARS

put your worn equipment back to work FASTER . . . MORE ECONOMICALLY!

Manganal 11 to 13½% Manganese-Nickel Steel Wedge bars eliminate long hours of building-up worn bucket teeth with welding electrodes. They usually outlast new teeth. MANGANAL work-hardens to 550 Brinell . . . thrives under severe impact and abrasion . . . tensile strength up to 150,000 p.s.i. 21 sizes to fit any tooth size.

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Name of Nearest Distributor on Request

STULZ-SICKLES CO.

SOLE PRODUCERS

91 N. J. Railroad Ave., Newark 5, N. J.

The Streme-Liner power sprayer is adaptable for use with insecticides, fungicides, cold-water paints, curing compounds, etc. It discharges over 3 gallons per minute.

New Power Sprayers

Six new power-sprayer models have been made available to the American market by Samuel & Hirschberg, 204 Valentine St., Hackettstown, N. J. The double-action 2-cylinder pumps of the Streme-Liners discharge over 3 gpm, according to the manufacturer. They may be powered by 1½-hp single-cylinder 4-cycle air-cooled gasoline engines or ¾-hp single-phase 115-volt induction-repulsion electric motors. Skid, tow-about, or wheel mountings are available.

The Streme-Liner, the company says, is adaptable for use with any type of insecticide, fungicide, cold-water paint, curing compounds, or disinfectant. All parts are standard and replaceable. The 50-gallon all-welded steel tank has a removable cover for cleaning. Discharge equipment includes 10 feet of ⅜-inch high-pressure spray hose with a 2-foot extension. The automatic shut-off can be locked open for continuous discharge. The angle spray nozzle is adjustable for any spray from fog to solid stream.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 113.

Imported Transits

The new Model TJ-10 Sokkisha transit, of strictly American type and design, has recently been imported and is available from the Warren-Knight Co., 136 N. 12th St., Philadelphia 7, Pa.

The erecting internal-focusing telescope has a length of 9.45 inches, a 23-power magnification, an effective aperture of 1.15 inches, and hairline stadia. All lenses are coated. The 5-inch-diameter vertical circle is graduated to half-degrees and has one double-vernier reading to single minutes. The 5.5-inch-diameter horizontal ring is graduated in half-degrees, numbered every 10 degrees in both directions with two double verniers reading to single minute. Thirty-second or 20-second readings are available.

The graduated rings are of sterling silver, the standards are of one-piece bronze construction, and the four leveling screws are of nickel silver. The compass ring is graduated to ½ degree and has a waterproof cover. The tripod plate has U. S. standard 3½-inch x 8 threads. A Warren-Knight Style B split-leg tripod and a hardwood front-door-type carrying case are standard equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 100.

Kadz Joins Southwest

Harry D. Kadz has joined Southwest Welding & Mfg. Co., of Alhambra, Calif., as Assistant Manager of the Construction Equipment Division. He was formerly General Manager of Kay-Brunner Steel Products, Inc.

Construction Industry's Role, Come Peace or War

Construction during 1949 reached a record peacetime total of almost $19,000,000,000, according to Dwight W. Winkelman, Past President of the Associated General Contractors of America. But even that expenditure is not meeting demands, he told the American Society of Civil Engineers at its annual meeting in November.

Civil engineers and contractors, he said, have a joint responsibility to industry and the public to see that needed construction is carried out economically and effectively. This means preserving the contract method and free competitive enterprise. It means encouraging the entrance of more young men into the civil-engineering field so that the industry will have adequate capacity at all times to meet the country's needs. And it means utilizing the full capacity of the industry to meet those needs—no idle men or machines.

The responsibility would be doubly heavy in the event of another war, said Mr. Winkelman. One of the first objectives of any enemy would be the destruction of America's productive capacity—its factories, bridges, highways, water systems, and other facilities essential to production and life. There would be only one direction in which to look for the repair of that damage—to the construction industry. The industry would have to repair damage to existing facilities, build new ones required, and provide men, machines, materials, and methods to the armed service for construction essential to military operations.

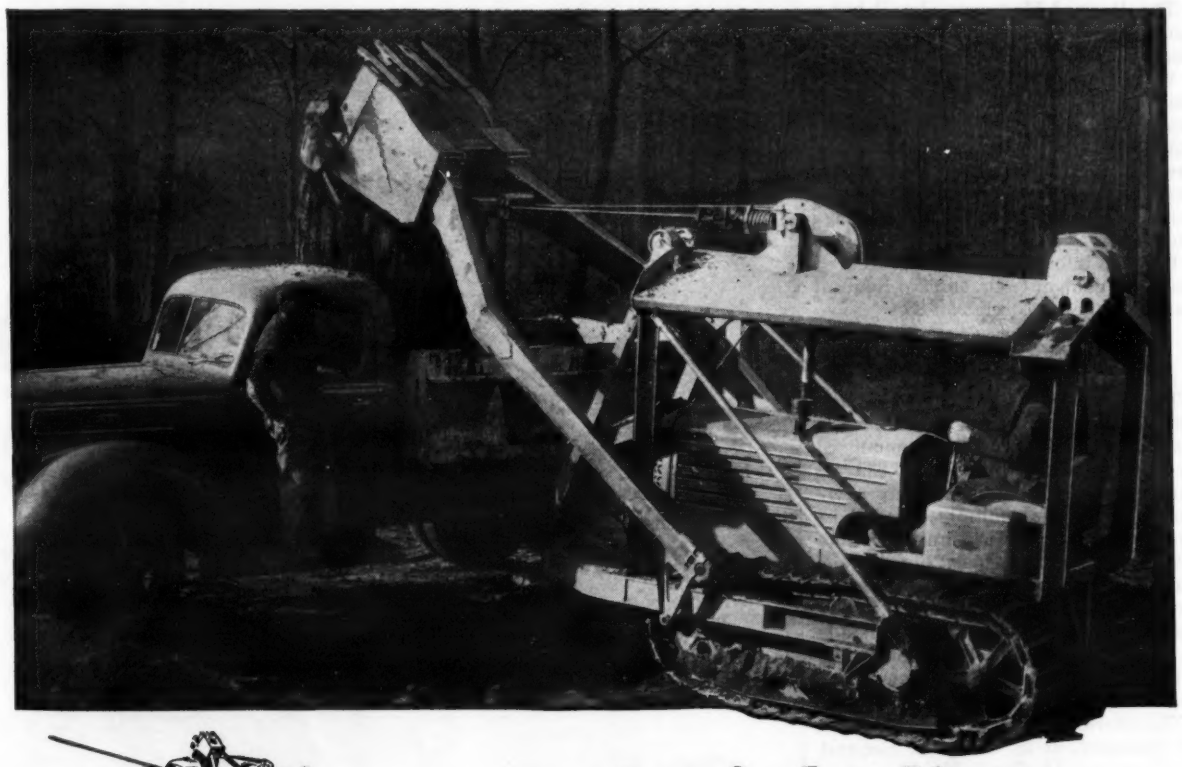
"Only by maintaining its virility and dynamic resourcefulness can the construction industry . . . render that full service to the public and nation of which it is capable," said Mr. Winkelman.

BEADLE OIL ROAD SMOOTHER

Cuts Costs 2/3!

Attach it to your grader for cutting and pulverizing high shoulders and bumps, filling in depressions, and compacting the material into a new wearing surface. Write for circular.

COATES MANUFACTURING COMPANY
CORYDON IOWA



. . . a straight line

is the economical distance between two points!

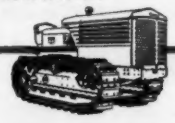
The straight-line operation of an Oliver "Cletrac" tractor and Sargent Overhead Shovel will cut your costs . . . *plenty!* Here's why!

This unit crowds *directly* back in digging or loading . . . moves *directly* forward to load out trucks. The shovel arms swing *directly* over the tractor. Contrast this fast action to ordinary loaders where the tractor must crowd into the pile . . . back out . . . turn around and travel to truck or dumping pile. Easy to see why jobs move so much faster . . . why you can really cut costs!

And, the Basic Overhead unit can be quickly and economically converted to a Backhoe, Bulldozer, Pipe Handler, or Log Loader . . . a complete crew at a fraction of the cost of combined individual units.

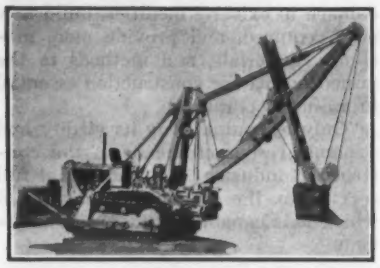
Your Oliver "Cletrac" Distributor will be glad to give the complete, cost-cutting story.

Cletrac
a product of
THE OLIVER CORPORATION
Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio
A complete line of crawler and industrial wheel tractors



OLIVER Cletrac

"THE SIGN OF EXTRA SERVICE"



This new shovel front for the tractor-mounted Hystaway now increases its variations to seven, including crane, dragline, clamshell, hoe front, bulldozer, and pile driver.

Tractor Shovel Front

A ½-cubic-yard-capacity shovel front is now available for the tractor-mounted Hystaway, according to an announcement by the Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg. Designed only for the Caterpillar D7 and D8 track-type tractors, the shovel front may be mounted on either new or used machines without major alterations, the company says. Utility use of the bulldozer is retained.

The ½-yard Hystaway shovel has a boom length of 16 feet 9 inches, a dipper-stick length of 11 feet 9 inches, and a weight of 3,900 pounds. The dipper-bail speed, with 10-inch lagging, is 81 fpm; the dipper-bail pull is 18,000 pounds. According to the manufacturer, the maneuverability of the tractor base permits the excavator to get into and work at jobs difficult for the average shovel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 83.

Flexible-Shaft Catalog

The new No. 50 catalog, containing complete information on Wyco flexible shafts and grinders, has been announced by Wyzenbeek & Staff, Inc., 829 W. Hubbard St., Chicago, Ill. Many new-model single and multiple-speed flexible-shaft machines are introduced in this catalog, which gives illustrations and important operating data. Parts and accessories are illustrated for better understanding, with explanatory details on grinding, sanding, wire brushing, polishing, de-burring and other operations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 63.

Sizing of Excavators And Hauling Equipment

A 24-page bulletin issued by the Power Crane & Shovel Association, 74 Trinity Place, New York 6, N. Y., tells how to size your excavator and hauling equipment correctly to obtain maximum output and minimum delay on the job. The third in a series of technical bulletins released by the Association, it is intended to round out the subject of functional design, job application, and ownership and operating costs previously covered in Bulletins 1 and 2.

The study analyzes factors which affect job efficiency, such as the type of material excavated, volume of work, spotting units at the shovel, distance of haul, and hauling cycles. It gives practical suggestions for improving overall output. Performance tables appear in the main body of the text, and the formulae upon which these tables are based are developed in an appendix to the bulletin. The study likens the excavator to the heart of the operation and the haul units to the arteries; as the blood supply diminishes if arteries are inadequate, so profit diminishes if haul units are inadequate, no matter how great the capacity of the excavator may be.

Copies of Technical Bulletin No. 3 may be obtained from the Association for 50 cents each; they will be furnished without charge to engineering schools and colleges.

To Head Welding Sales

R. J. McCallian is now District Sales Manager in southeastern United States for Stulz-Sickles Co., New Jersey producer of Manganal welding products and Seaco hard-surfacing electrodes. He will aid distributors and customers in his territory with advice on salvaging and repairing parts and equipment, and, in general, cutting welding costs.

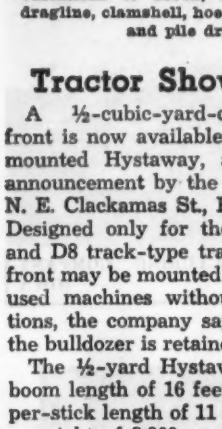
The MOORHEAD Portable Aggregate Drier

is used on numerous types of work where it is the purpose to heat and dry materials preparatory to mixing. The material is thrown or discharged into the hopper and thoroughly dried and heated in traversing the length of the trundle by the intensely hot flame of the burner.

The unit is sturdily constructed and may be attached to any vehicle. Drier has a capacity of from 5 to 10 tons per hour. Furnished with electric motor and on skids for stationary use.

Write for folder

MOORHEAD MACHINERY & BOILER CO. 927 Second Ave., S. E. Minneapolis, Minnesota



STOCK SIZES:
Model A 6x12" I.d.
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This CONCRETE TEST CYLINDER MOLD is Accurate—Saves Time

Accurately machined to produce concrete samples of exact measurement. Sturdily made of refined malleable iron. Strong bronze wing nuts and swing bolts. Inside dimensions shown above. Portable. Your order will be promptly handled. If you want additional information write

MOLINE IRON WORKS
MOLINE, ILLINOIS, U.S.A.
(Seventy Years of Service)

with reserve cutting power—

CP Hi-Speed Electric Saws

Helical gearing, high blade speed, an extremely high powered motor, unusually rugged construction insure the necessary power to make fast, deep cuts in hard wood. Gearing requires only occasional lubrication and no special lubricants. Lifetime bearings are self-lubricating.

Made in three sizes: 7½", 8¼" and 9½" blades.

Outstanding features include 55° of bevel adjustment, 10° more than any other saw; easy adjustment of depth of cut from zero to $2\frac{7}{16}$" on the 7½" blade; $2\frac{13}{16}$" on the 8¼" blade; and 3¼" on the 9½" blade.

Special blades can be furnished for cutting through nails, copper, brass, bronze, lead, tile, glass, brick, clay products, concrete, marble, flagstone, asbestos, cement products and composition board.

For complete information write for Bulletin 3000.

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Steel Forms Speed Building Concrete

Foundation Under New State Office Building Goes In Rapidly Ahead Of Steel Erection

✦ EXCELLENT progress is being made on what Iowans consider the most important building project currently under way in their capital city of Des Moines. Here the foundation and lower floors of the new State Office Building are rapidly taking shape. The imposing $5,000,000 structure, being erected on the grounds near the State Capitol, is being constructed by Kucharo Construction Co. and Johnson, Drake & Piper, Inc.

Good organization and up-to-date building methods are chiefly responsible for the showing which the contractor, with Lou Glenn as General Superintendent, has made. And the work is being done despite a 6-week labor strike in the middle of the summer, followed by a period of rainy weather which filled up the excavated foundation site several times.

Atlas Speed Forms, patented steel panels of varying length and width, are helping to hurry the concrete along. Construction began officially on March 21, 1949, when the structure excavation was started, and by early fall Lou Glenn expected to have all his concrete for the foundations placed.

"We don't have to hurry any more," the experienced, genial superintendent said with a smile. "We'll have it done and be sitting around on nail kegs before they start shipping the steel on September 26." That was in August.

Excavation Subbed

The structure excavation amounted to a block of hard clay about 22 feet deep, and slightly larger than the outside dimensions of the new building. Since the building is 246 feet 8 inches long and 120 feet 8 inches wide, it was quite a chunk of material.

It was a natural truck job, so a fleet of 5-yard dump trucks was used with a peak of 5 draglines and one bulldozer. A large block of the material was stockpiled near by to be used as backfill, while the remainder went to a disposal ground only 2 blocks away from the site. It was not a tough excavation job, although some of the clay was a bit difficult to dig. Some of the stiff gray and brown clay gave bearing values of 7,000 to 8,000 pounds per square foot, which was the reason pile driving was not required in the foundation work.

The building is to have two basement floors and an air-conditioning tunnel underneath the natural ground level. The machines did not have to dig out for a boiler room, because a steam tunnel has been installed for several years. It runs around the outer edge of the capitol grounds, and the state office building will take its heat through an 8-inch steam pipe from that tunnel.

Thus the excavation was custom-made for rapid progress. With the exception of a few rains which filled up some of the low spots, no ground water was encountered. The footing foundations for columns, which extended down beyond the basement floor grade, were clammed out by an Osgood clamshell-crane, and the edges trimmed to neat lines by a labor crew.

C. & E. M. Photo

In the shadow of the Iowa State Capitol at Des Moines, the foundation work for a new State Office Building gets under way.

Steel Forms Speed Work

Carpenters, steel setters, and concrete men were at work before the last dirt was gone. The work is progressing unusually fast for building construction . . . so much so that a 105-yard concrete pour was made before noon when this magazine visited the job.

One of the secrets of the fast-moving concrete work was the use of Atlas Speed Forms. There were about 6,000 square feet on the project, which was so close to what was needed that practically every panel was in use all the time. In addition, a few prefabricated wood forms were used, particularly in places like the air-conditioning-tunnel

(*Continued on next page*)

WILLIAMS

"SUPER-HI" TENSILE STEEL

Concrete Form Hardware
Clamps—Tie Rods—Couplings
and Pigtail Anchors

GREATER SAFETY
LESS WEIGHT TO HANDLE
INVESTIGATE WILLIAMS ECONOMY

WILLIAMS FORM ENGINEERING CORP.

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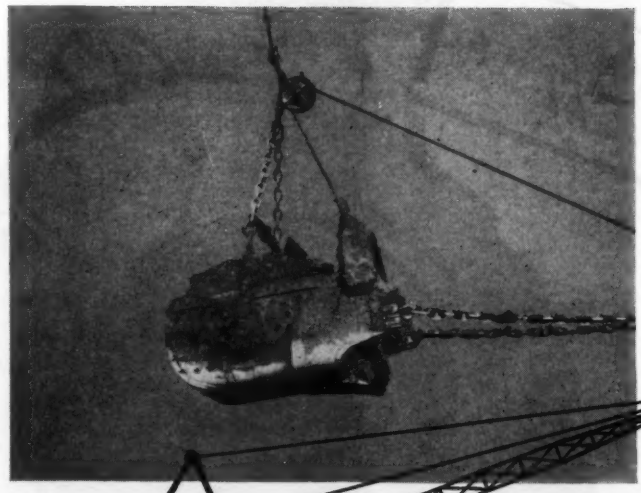
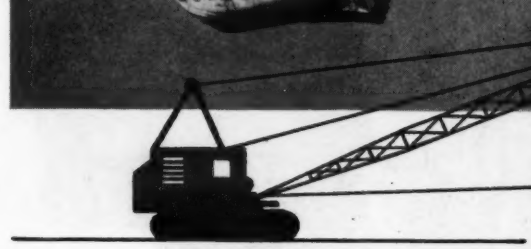
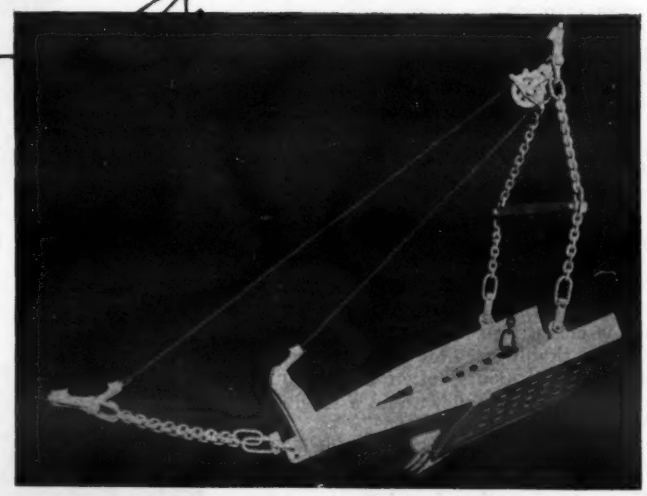
YAUN'S DIGGING PAIR FOR BIGGER PROFITS



Yaun's Dragline Buckets—either solid, perforated or basket type—fill faster, dump cleaner and quicker because of their unique design and size-to-weight ratio. Engineered for perfect balance means easier handling for your operator. All buckets available in three weights: light, medium and heavy duty.





Yaun's "Contractor's Ditching Bucket" is another step forward in reducing costs for contractors. Scientifically designed, this bucket digs shallow wide sloping ditches in the sizes needed for the job. Available in sizes from ½ to 1 yard in medium duty weight. Write for full details on this new bucket.

YAUN WELDING AND DRAGLINE BUCKETS, INC.
BATON ROUGE, LOUISIANA

C. & E. M. Photos

At left, a clamshell crane excavates a footing for the Iowa State Office Building. Above, the zig-zag sub-tunnel work under the building. At right, a carpenter crew assembles a panel of Atlas Speed Forms.

Steel Forms Speed Building Concrete

(Continued from preceding page)

inside wall, where the forms had to remain in place for about a week before they could be stripped.

The Atlas forms for the job were all either 6 or 8 inches wide, and the lengths ran 4, 6, and 8 feet. The variety of widths and lengths made it possible to fabricate any of the walls and shaped surfaces in the foundation.

As a rule the panels were assembled singly, or seldom more than two together, for each pour. As the carpenters brought the steel panels in, other men set them together and joined the flanges by the patented cloverleaf device with a steel locking wedge which passes through the flange holes. In order to shape a column from the straight wall, the panel flanges were simply reversed in the direction the concrete column was to go, and a vertical strip of angle iron was fitted into the groove. These pieces of angle iron were also drilled congruent with the form flanges, so the clips could hold them together.

Some of the pours were high and heavy. The foundation wall is 2 feet 2 inches and 2 feet 7 inches thick, which threw a great deal of weight against the forms. To contain this load, the steel panels were braced on the outside by double 2 x 6 wales, spaced about every 3 feet. Richmond steel Tyscrus, with wood cones, were used to pass through the form panels and hold them together.

In the case of foundation wall pours, the forms were also often braced externally by 4 x 6 shores, which went out to the steep clay banks outside the walls.

The appearance of stripped concrete has been a source of pride to big Lou Glenn for many years, and he pays particular attention to the alignment of forms and their oiling. He insists on the forms being perfectly clean and well oiled before each pour. His concrete is clean, free from rock pockets, and remarkably free of air bubbles. Ordinarily his pours, often 30 or 40 feet long, stripped out without a single rock pocket.

Truck-Mixed Concrete

Concrete for the foundation was 2,500 and 3,000-pound Class A material, and was designed with Pozzolith to reduce the water content and entrain about 3 per cent of air. This material was batched from two Des Moines commercial plants, and furnished to the job in truck-mixers.

Most parts of the walls were accessible from the adjacent ground above them, and with the exception of just a few places, the concrete was placed

(Continued on next page)

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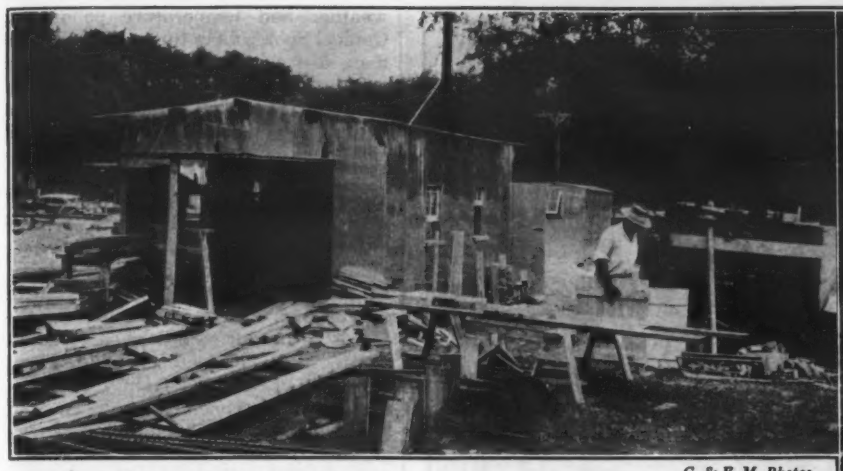

C. & E. M. Photos

Alcoa aluminum panels made up this saw shed (above) and all job buildings on the State Office Building contract. At right, in the usual order, General Superintendent Lou B. Glenn and architectural representative K. J. Maine.

direct from the mixers. A usual stunt was to lay a 3 x 10 timber along the top of the bank as a guide for the chute, with a wooden chute trained from that timber down to the pour. In order to prevent excessive surge, the big chutes were fitted with wooden baffles on opposite sides, placed about 8 or 10 feet, to slow the concrete down as it slid to the pour.

More emphasis was given to vibration here than we have seen for some time. Thorough vibration, plus puddling in tight places if Lou Glenn thought it necessary, was a rule. There were two gasoline-driven Jackson vibrators on the job, and when the truck-mixers appeared they did constant duty.

The 8 and 10-foot pours were made by filling the Atlas forms evenly all the way across, and bringing the concrete up at an average rate of 4 feet an hour. The forms and form ties would not stand much more than that, although tests made by contractors have often proved that they will exceed their rated strength.

The forms were allowed to remain in place usually from 24 to 48 hours, after which they were stripped, cleaned carefully, and moved ahead. Concrete curing was done with water sprinkled on the green material by a hose.

At the end of each pour, there was often a half-yard or so of good concrete. Rather than waste this material, the carpenters made up several wood boxes 3 inches deep. The concrete was placed in these boxes. Next morning the men removed it, broke it up with hammers, and presto! . . . they had plenty of 3-inch spreader blocks to place under the steel reinforcement.

Another stunt was the "insuring" of air-conditioning-tunnel bottom pours, vulnerable to rainwater, by a non-pay seal pour of concrete. When the fine-grading was done in these low places, fresh concrete was placed to a depth of about 2 inches. Then if rains or slides came along, the pour was never so filled up that it could not be cleaned out quite easily.

Portable Sheds Serve Job

Portable buildings, made from wood frames and panels of Alcoa aluminum sheeting, served the various phases of the job. The office was made out of this material. It contained the general accounting department, Lou Glenn's office, and an office for K. J. Maine, Resident Engineer and representative of the Des Moines architectural firm of Tinsley, Higgins & Lighter, who designed the building.

A small shed housed the DeWalt power saws which cut wale timber, made screeds, and did other carpenter work. A long shed housed all the warehouse supplies. Easy to dismantle and move, the sheds present a new, neat appearance even in the shadow of the ornate Iowa State Capitol Building.

Space Already Assigned

The space for the five main floors above ground, a sixth floor set back slightly, and the penthouse atop the building is already assigned. Completion of the magnificent new structure a year from next March will permit many of the widely scattered state functions to consolidate under one roof.

It will be a beautiful building. The

(Concluded on next page)

A BIG MACHINE
9 MACHINES in ONE
with HUBER attachments
BUSY EVERY MONTH OF THE YEAR
.B. GRADER
Chlorid olution
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Does More Work •
Handles Bigger Variety
of Jobs • Costs Less to Buy •
Less Costly to Operate •
Gets around Like a Truck
HUBER
TO r write for Bulletin M138
C MPANY • MARION, OHIO

Steel Forms Speed Building Concrete

(Continued from preceding page)

windows are to be all-aluminum frames and sash, and the outside of the building will be faced with Bedford building stone and greenstone spandrels. Finished floors will rest on concrete fill on Robertson Q-flooring, which will in turn be supported on the structural-steel members. There will be 42-foot spans of structural steel on the outer extremities of the structure.

The office areas will be subdivided, as required, by movable-type steel partitions, with rubber-type floors and acoustic-tile ceilings. The building is completely air-conditioned. Four passenger elevators and one freight elevator will serve the many employees who will use this new structure to transact a great state's business for many years in the future.

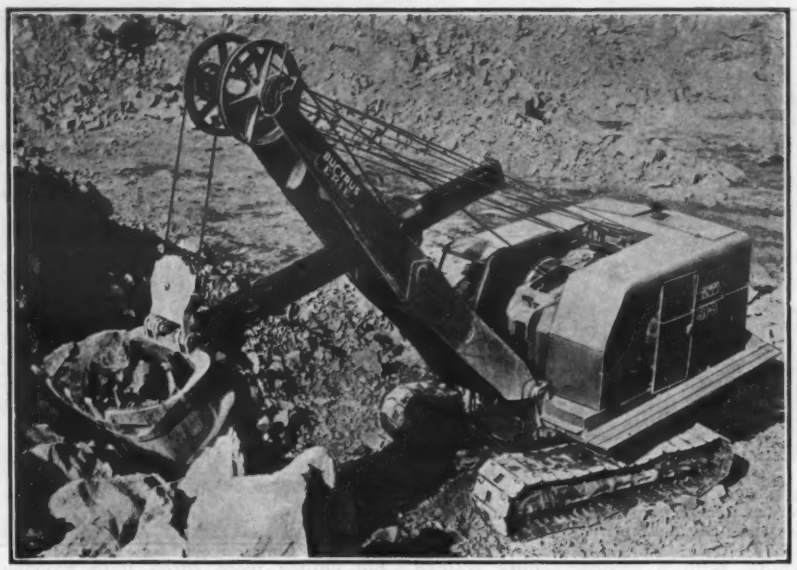
Two-Yard Unit Joins Line of Excavators

After extensive field testing, a new 2-yard power shovel—the 51-B—joins the line of ⅜ to 2½-yard excavators made by Bucyrus-Erie Co., South Milwaukee, Wis. Convertible in the field for crane, dragline, clamshell, or shovel service, the 51-B is designed for general contracting and quarry operations.

The single-unit inside dipper handle of the 51-B is similar to other of the company's machines, including the 36-yard 1050-B stripping shovel. The twin-rope crowd is fully independent of hoist. Full engine power may be applied to the crowd if necessary. Direct mechanical control of crowd, hoist, and swing is designed to give a fast digging cycle.

For dragline and clamshell service, booms from 50 to 90 feet in length are available. Crane booms may be purchased up to 110 feet in length. Additional reach for the lifting crane is provided by using one of several jib extensions available.

Contractors may choose diesel or electric power in the new 51-B. Main hoist, swing, boom hoist, crowd, and retract machinery operate on anti-friction bearings. Clutches under direct, instantaneous mechanical control have single-point adjustment for wear—and adjust themselves automatically for weather and temperature conditions. Conical hook rollers turning in a double flanged track take both upward and downward loads and eliminate use of center pintle. The revolving frame is cast steel, and the streamlined cab has easy-opening doors and tempered safety-glass windows.



A new 2-yard power shovel, the 51-B, has joined the Bucyrus-Erie line of ⅜ to 2½-yard excavators. It is convertible for crane, dragline, or clamshell service and is diesel or electric-powered.

Standard mounting offers a choice of 30 or 36-inch crawler treads. Longer mountings with 36-inch tread are available for crane and dragline service. New round driving tumblers with curved lugs engage curved lugs on the treads to produce smooth, easy movement, the manufacturer points out. Crawlers are steered from the operator's position; chocking pawls to hold the machine while digging are also engaged and disengaged from the operator's position. Both steering clutches and chocking pawls are completely enclosed to keep them free of dirt.

Detailed information about the new 51-B may be obtained from the manufacturer, or by using the Request Card at page 16. Circle No. 30.

NEW! Heating Unit for Winter Jobs

- Ideal for Concrete Work
- Quickly Thaws Out Materials
- Over One Million B.T.U. Output

BEHLEN HEAT BLOWER

$407 FOB Columbus, Nebr.

A sturdy, dependable heating plant. Has many construction uses. Recommended for concrete work in low temperatures. Warms aggregate at batching plant; prevents freezing concrete while setting. Just the thing for drying and curing plaster or paint and other such jobs. Preheats machinery. Burns 1 to 9 gals. distillate or kerosene an hour; furnishes up to 1,100,000 B.T.U.'s direct heat per hour. Built-in fan delivers up to 7,000 CFM at ½ inch water pressure or 5,000 CFM at 5 inches pressure up to 250° F output. Gasoline or electric motor furnished if desired. Adjustable outlet pipe is removable for adapting to fit job. Mounted on skids. Used on Federal and private construction. Almost 3,000 in use on farms dehydrating corn. Beat cold weather delays . . . write, wire for full information . . .

BEHLEN MANUFACTURING CO.
DEPT. 9 COLUMBUS, NEBR.

Out Ahead Again FOR 1950!

New "Weight-Saving" Diesel Tractors • New Middle-Weight Six-Wheelers
New Power and New Features in Light and Medium Duty Models

Once again GMC leads the truck transport parade . . . once again GMC introduces improvements in design and function . . . once again GMC widens the scope of truck performance and truck usefulness.

For 1950 there's a new heavy duty 2½-ton "470" series . . . two new "400" and "620" series six-wheelers . . . two new "weight-saving" Diesel-powered tractors built to handle maximum legal payloads in the 45,000-55,000 pound weight range . . . a new 1½-ton "280" series of 11,000 pounds GVW.

These new models combine to offer GMC power, dependability and economy to many more operators . . . and all along the line GMC's move even further out in front. New camshafts, valves and manifolds step up the power in light-medium models. Wider seats, more headroom and improved sealing increase their cab comfort. And there are new chassis features, including new hydraulic and optional air brakes on 2½-ton models, new front springs with airplane-type shock absorbers on light trucks. Your nearest GMC dealer has complete facts. See him soon.

Construction contractors, oil field operators and movers of earth and rock will find a model ideally suited to their hauling needs in the GMC line which ranges from 4,600 pounds GVW to more than 90,000 pounds GCW. The two new six-wheelers, for example, with 24,000 and 32,000 pound GVW ratings are particularly well adapted to construction, oil field and quarry transport jobs.

GMC GASOLINE • DIESEL TRUCKS

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

C. & E. M. Photo
T. L. Powell, Wixson & Crowe's Superintendent, holds one of the special drill chucks he had made in the shop.

Small-Size Tunnel Presents Difficulties

(Continued from page 41)

Caterpillar D13000 diesel-electric generating set, and an engine-driven blower were all set inside the machine shop and crew change shed outside the north portal. The temperature went to 31 below zero, but the shed stayed warm. All mechanical repair work, bit grinding, and auger facing was done in this shop.

An average excavation round was 6 feet long. Shift bosses made a few tests on hole patterns, and then settled down to a 15-hole round. These holes were drilled by men working off a small timber platform. Two Ingersoll-Rand 44J Multi-Vane coal auger drills were used, with Sulmet No. 2 auger bits. Each drill, equipped with two handles, was held in position by two husky miners, who "bucked" the auger in to its full 6-foot depth.

Several difficulties arose immediately. The rock was so abrasive that the spiral edges of the auger wore down rapidly. That was solved by having the welder run a shallow bead of Stoody Self-Hardening rod over the outside edge of the spiral. The bit chucks also started giving trouble by twisting off, under the power of the air. The hexagonal edges of the drill shanks also began to wear badly, and soon they were so nearly round that the chuck would fail to hold them tight.

Powell, Wixson's superintendent, did some experimenting. He obtained some larger-sized Jackhamer chucks, and welded them on to the adapter from the auger drills. Then he shanked the auger bits with Jackhamer steel shanks, to fit. He finished up with a mechanical joint about 5 times stronger than the standard one, and he had no more trouble.

When the holes were all drilled, the round was loaded with approximately one 50-pound box of Hercules 60 per cent gelatin powder. No zero delays were used, and there were three No. 1's, and two each of No. 2, 3, 4, 5, 6, and 7. The delays were arranged in standard tunnel sequence, breaking out the center core first, then cracking rock into the hole from breast, arch, rib, and lifter holes.

After each blast, a 12-inch blower forced clean air back to the tunnel heading, and the crews were at work long before the smoke traveled outside the tunnel.

Loose rock was scaled off to make the tunnel safe, and the approximate 15 cubic yards in each round was loaded out by a Conway mucking machine. This was a Model 60 cut down to fit the small-diameter bore. Hauling equipment consisted of two General Electric trains with a total of three 4-cubic-yard side-dump cars.

For the first 1,800 feet of tunnel, one car per motor was used. At that point the tunnel was enlarged by blasting to install a "California switch": a wide point where cars could pass each other. Four carloads were usually sufficient to carry off all the broken stone from a blast.

The disposal of material included one of the most radical departures from standard tunnel procedure which many of the men had seen. Faced with the

(Continued on next page)

Dallett's Contractor Tools

ASPHALT CUTTERS
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MOIL POINTS
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GADS
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DIGGING CHISELS

DALLETT'S Line of Contractor Tools are made under rigid standards and from material best suited for their intended applications. Dallett's quality tools will always give top performance.

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Manufacturers of Pneumatic Tools and Accessories
DISTRIBUTORS in principal cities throughout the United States, Canada, Europe and South America.

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FRANK D. MESSENGER
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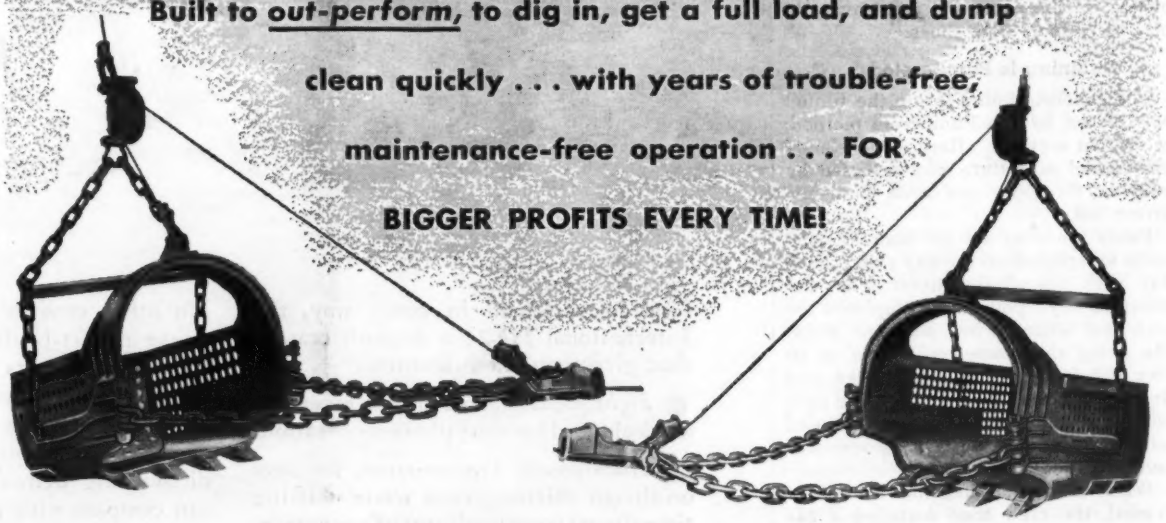
FAIR HAVEN, MICH.
Use "Messenger" Service
Some exclusive territories now open for dealerships.

Matchless

Matchless ability to hang onto a load and put dirt where you want it *fast* . . . that's the kind of performance you get with HENDRIX DRAGLINE BUCKETS on every earth-moving job.

Built to *out-perform*, to dig in, get a full load, and dump clean quickly . . . with years of trouble-free, maintenance-free operation . . . FOR BIGGER PROFITS EVERY TIME!



LOWER MAINTENANCE—HIGHER PROFITS

3 TYPES FOR EVERY DIGGING PURPOSE

3/8 to 40 CUBIC YARDS

★ Full Payload Every Trip . . . FOR MORE PROFIT!
★ Rugged All-Welded Construction . . . LOWER MAINTENANCE COST!
★ 14% Manganese Steel Chains and Fittings . . . STANDARD ON ALL SIZES!
★ A Type for Every Job . . . light, medium, and heavy-duty. WITH OR WITHOUT PERFORATIONS.

HENDRIX Lightweight DRAGLINE BUCKETS

For descriptive literature ask your dealer or write

HENDRIX MANUFACTURING CO., INC.
MANSFIELD — LOUISIANA

Small-Size Tunnel Presents Difficulties

(*Continued from preceding page*)

certain knowledge that the winter weather would be quite severe, Powell knew that his crews outside the portal would freeze, even if the railroad track didn't. And there was a strong possibility that the tracks also would freeze up so that they would be impossible to move.

Using long 12 x 12's for uprights, he built a short trestle about 18 feet high from the original ground, which was somewhat lower than the tunnel portal. The loaded cars simply moved out over the trestle, were dumped, and once every day the waste rock excavation was shoved away by a Caterpillar D7 and its bulldozer blade. The total excavation consisted of about 8,000 cubic yards, which was disposed of easily with room to spare so far as the trestle was concerned.

Tunnel excavation was closely coordinated, and when the work was finished, the three mining crews had averaged 25 linear feet per day. On the last day of excavation, contractor's men and USBR engineers and inspectors gathered at the south portal. Each man, in the true gambling spirit of the west, put a silver dollar where he believed the first drill hole would come through. Silver dollars were scattered over quite an expanse of rock.

The Bureau surveyor, who had maintained line and grade all through the tunnel, calculated his location with mathematical precision. He figured exactly where he believed the first drill hole in the round would break through. He even made a measurement or two. Then he put his silver dollar on that spot. He hit it right on the nose. When the drill bit tore his dollar loose, he picked up the coins and went away to buy baby some new shoes.

Lining Is Pumpcreted

The concrete lining inside the tunnel was placed by the Pumpcrete method, in 60-foot sections. Here again standard tunnel procedure was reversed by pouring the sides and arch first, the invert last.

Pours were so set up that all concrete was placed on the day shift. Each day shift placed the invert from the previous day's pour, and completed the arch and sides of one section. When the swing shift came on, it tore up 60 feet of 3-foot-gage railroad tracks, and fine-graded the tunnel floor. The rails and excess fine-grading were hauled outside by one of the G-E locomotives and a car.

When the tunnel floor had been fine-graded, the crew then installed a 24-inch narrow-gage track. This carried the 60-foot steel form. This form was originally made for a 12½-foot tunnel, and used at Cody, Wyo. It was then used on a job at Redmond, Oreg., cut down, and brought to Riverton.

Swing-shift work included all preparation necessary to put everything in readiness for the move ahead.

When the graveyard shift came on at midnight, it collapsed the steel form by taking the pressure off of 4 hydraulic roof jacks and 12 steamboat ratchets, which were spaced 6 to a side on 10-foot centers. Hanging on its steel framework, the form was then rolled slowly ahead 60 feet and spotted again in position. A 4 x 6-inch timber at the base of the steel was used to make the tie joint with the invert. This stripped quite easily when the toe of the form collapsed.

Set again in position, the form was racked out to line and grade by using the ratchets and jacks. Acting as spreaders, the ratchets prevent the weight of concrete lining from collapsing the forms. The graveyard shift operated so that when it went off duty, everything was in readiness for the day shift to start concrete.

Sand and aggregates for the mix were trucked in from the Government pit where Gilpatrick Construction Co. produced the material. Monolith Type V Sulfate cement was used, and mixing water came from the canal, which was dammed near the tunnel. The trucked-in aggregates were stockpiled on the ground, loaded to a truck by a Wagner Scoopmobile, and hauled up a ramp where the truck dumped the materials directly into the hoppers of a 40-ton batch plant.

The batch plant weighed the correct proportion of sand and rock. and dumped the dry material to an old converted 27-E Rex road paver. This machine mixed the materials with cement, water, and Protex air-entraining agent, and transferred the concrete at a slump of about 4 inches to two special agitators, built many years ago by Pacific Gas & Electric Co. out in California.

As each agitator received its load, it was pushed in to the Rex Pumpcrete machine located next to the pour. It had been necessary to reduce drastically the size of the Pumpcrete hopper by cutting it down, which reduced its surge capacity. To have a supply of concrete available while the agitator was gone, Powell built a 1½-cubic-yard bucket, and rigged it with a little Gardner-Denver air tugger so it could be hoisted to the feeder conveyor on the Pumpcrete machine, like a skip on a concrete mixer. A manually controlled gate permitted the load to be dumped on the belt by the operator.

The agitators discharged their loads into this hopper, where it was fed to the Pumpcrete hopper as needed. The Pumpcrete operator was near enough to the concrete gang that they could yell in case they wished him to stop.

A 6-inch delivery pipe led to the previous day's invert, which was placed the first thing in the morning. Then the concrete was sent to the main pour, and dumped in the top of the form. As the concrete built up to the top, it was vibrated thoroughly by Viber electric external-type machines; the delivery pipe was retracted as the far end of the form was filled. This procedure was carried through until the pour had been finished out to the timber bulkhead on the leading side of the pour.

(*Concluded on next page*)

First in the field in every way, the International TD-24 is the only crawler that gives you these features:

● *Eight Speeds,* forward and reverse—an ideal speed for every phase of operation.

● *Synchromesh Transmission,* for easy on-the-go shifting, cuts waste shifting time almost completely out of your cycle.

● *Planet Power Drive* gives you power on both tracks in a turn for magic maneuverability *plus* an instant shift up or down one speed in both high and low range.

● *Finger-Tip Hydraulic Steering* control erases operator fatigue.

● *140 Drawbar Horsepower* gives you more working horsepower than any other crawler.

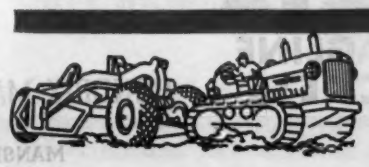
No other crawler tractor has any of these profit-building features that shrink your costs of operation. Like every operator who has applied the seat of his pants to the comfortable cushion of the TD-24, you too will say, "It's a dirt-moving demon—no other crawler can compare with it."

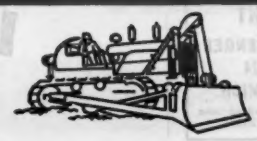
See your International Industrial Power Distributor now and get the champion crawler of them all—the International TD-24—to work for you.

INTERNATIONAL HARVESTER COMPANY • Chicago

Hot news from the "grapevine": J. W. Mosely, contractor on the big Grapevine Dam project near Dallas, Texas, says of his International TD-24's, "In my estimation, the International TD-24 crawler tractor is the new champion of crawlers."

INTERNATIONAL
INDUSTRIAL POWER





INTERNATIONAL HARVESTER

By maintaining exact schedules on pouring, fine-grading, and moving ahead, Wixson & Crowe averaged a 60-foot pour each day while the concrete lining work was in progress.. The stripped concrete was sprayed with membrane curing solution.

Despite the small diameter of the tunnel, coupled with abrasive rock and the ever-present danger of accidents, this subcontractor finished safely and ahead of schedule. Red Wixson, who is as famous at Hungry Horse Dam for developing a new method of land clearing, as he is at Riverton, is never afraid to try something new. On Muddy Ridge Tunnel it paid off well.

Need information on equipment? Use Request Card at Page 16.

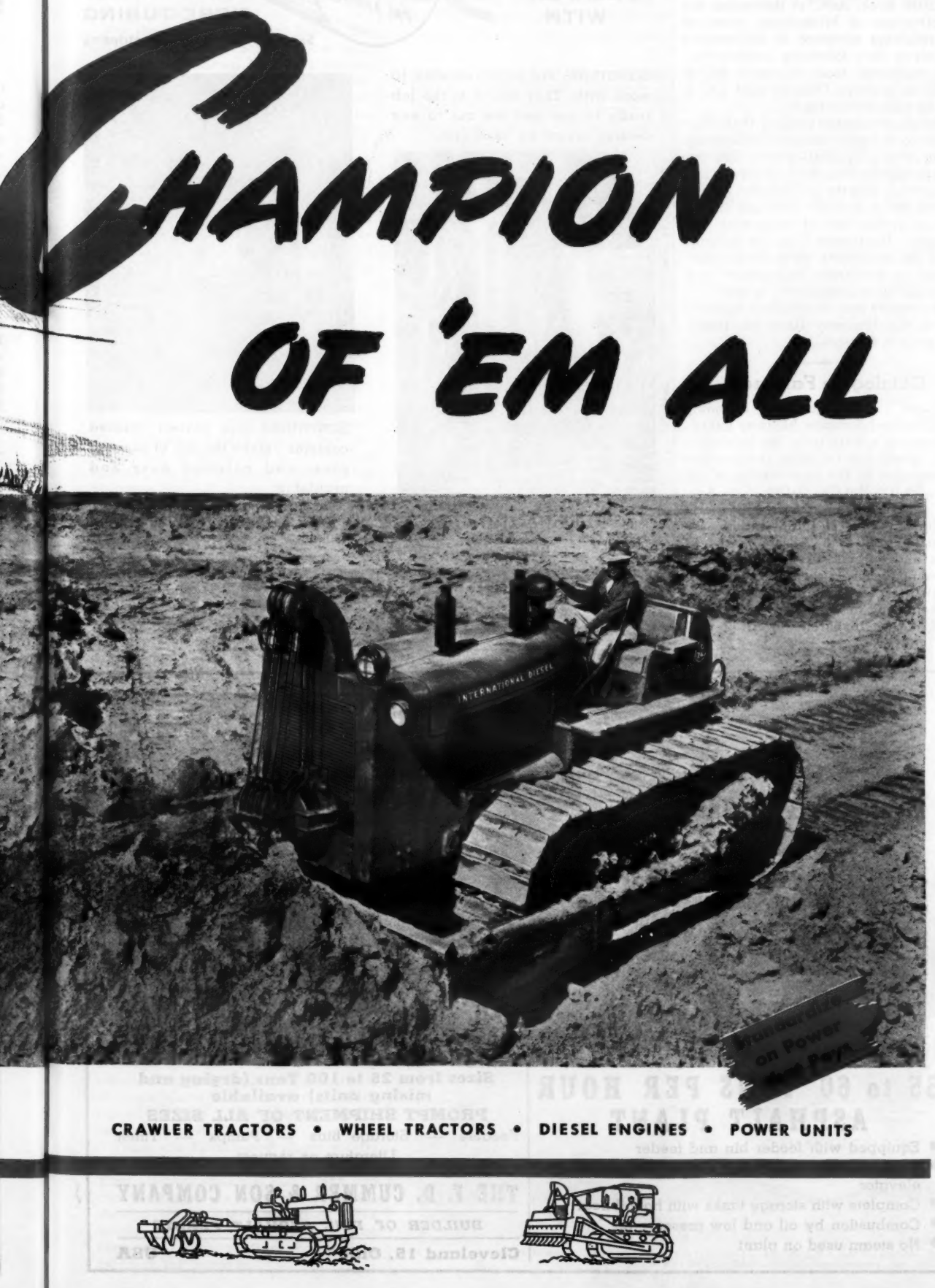
Steel Beam Guardrail For Bridges and Highways

Features, applications, standard details, and assembly plans for Safety-Beam guardrail are given in the new 4-page folder offered by the Bethlehem Steel Co., Bethlehem, Pa. The catalog points out that Safety-Beam is furnished in two types: a 10-gage 0.30-carbon steel with a 70,000-pound breaking strength at the joints, and a 12-gage 0.30-carbon steel with a 50,000-pound breaking strength at the joints. Safety-Beam, rolled of heavy steel plate in channel design, is available in standard 12-foot 6-inch sections which, when bolted together on steel posts, form a continuous impact-absorbing beam. It is also furnished in sections up to 50 feet in length. Full details of installation are included in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 43.

CCA Names Field Engineer

The Calcium Chloride Association, Washington, D. C., has added another member to its staff as field engineer in the north-central states—James D. Hodges of Rock Island, Ill. Mr. Hodges joined the U. S. Army Corps of Engineers as a second lieutenant in 1941. After attending service schools in road building and soil stabilization, he was assigned to the South Pacific, where he spent 30 months as a captain supervising road construction.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INTERNATIONAL DIESEL
Dependable on Power
CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS

American Concrete Inst. Convenes in New England

The New England regional meeting of the American Concrete Institute in the Hotel Kenmore, Boston, November 10-11, was attended by more than 400 architects, engineers, contractors, and students. The sessions stressed new developments in concrete construction, but warned against misuse of concrete.

C. H. Scholer, Head of the Department of Applied Mechanics at Kansas State College, was the principal speaker at the opening session. His speech, "A Study in Concrete", outlined research findings and technical advances in concrete construction, and noted the rapidly expanding market for concrete.

Herbert L. Gilkey, President of the Institute, told delegates that both steel and concrete buildings survived a Japanese earthquake, but only concrete structures withstood the blast of America's atomic bomb. "Concrete is best," he said, "where very intense fire may occur."

John E. Allen, Chief of the Engineering Division of the Boston District of the U. S. Engineering Office, described the reinforced-concrete aircraft hangars just completed at Limestone, Maine, and Rapid City, S. Dak., for the United States Air Force. Other concrete-construction experts gave details of large hydroelectric power plants and dams in the United States and Canada.

At the final technical session, F. H. Jackson, Principal Engineer of Tests for the Bureau of Public Roads, spoke on the "Essential Qualities in Pavement Concrete". He suggested that the lack of durability of much present-day concrete may be due to the methods of construction. A significant improvement in pavement durability, he said, could be effected by using a scientifically proportioned mix of dry consistency, well compacted by vibration or tamping, and with close control over aggregate gradation—in place of the oversanded plastic mixtures now in use. England and Germany, Mr. Jackson said, have been successful with this method.

Following Mr. Jackson's speech, Robert C. Hanckel, a consulting engineer, and Thomas F. Gilbane, President of Gilbane Building Co., Inc., discussed the advantages of precast-concrete construction. The meeting closed with an inspection trip to construction jobs under way in the Boston area.

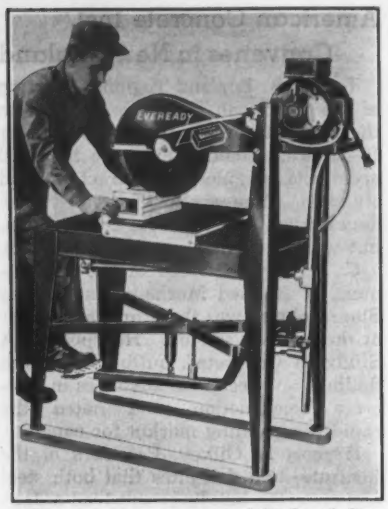
Hardened Wearing Parts For Shovels and Crushers

A 4-page folder on Oro alloyed-manganese-steel replacement parts for shovels and crushers is available from The Kensington Steel Co., 499 E. Kensington Ave., Chicago 28, Ill. Kensington has developed three special alloys of manganese steel—Supermang, Kenkrome, and Oroloy. Each of these steels has been formulated to withstand varying conditions encountered in pulverizing stone. The replacement parts offered in the catalog include crawler treads, dipper tooth points, drag and hoist chain parts, jaw and cheek plates, bowl liners and mantles, concaves and mantles, hammermill parts, grate sections, and renewable tips for hammers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 115.

G-E Promotes MacDonald

D. S. MacDonald, formerly a motor control specialist in the Baltimore office of General Electric's Apparatus Department, is now Assistant to the Manager of the gear motor sales division in the company's Small and Medium Motor Divisions. Mr. MacDonald joined General Electric at Schenectady in 1933 as a student engineer on the test course.



The new masonry saw introduced by Eveready may be used for wet or dry cutting with abrasive or diamond blades.

Masonry Cutting Saw

A new masonry cutting saw has recently been introduced by the Eveready Briksaw Co., 1509 S. Michigan Ave., Chicago 5, Ill. The saw is designed to cut quarry tile, brick, partition tile, and concrete block. Equipped for standard dry cutting, it may also be used for wet cutting by the simple attachments of a wet-cutting kit. The company says that there is no need to unhook the Eveready pump when cutting dry as it cannot be damaged in the dry-cutting operation.

A foot control switch enables the operator to move the cutting head in an arc of 10 inches above or below the horizontal position. The cutting head can be adjusted for widely different sizes of materials. An automatic blade-pressure spring adjusts the blade pressure to the hardness or softness of the material. A complete line of dry-abrasive, wet-abrasive, and diamond blades is available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 21.

Manual Power Puller

Manual power pullers with a wide variety of applications in the construction industry are manufactured by The Wyeth-Scott Co., Sisal St., Newark, Ohio. The three models available differ only in the length of cable that each will handle; 20, 30, and 40 feet. The company states that the Model 2-20 puller, with a 36-inch lever, raised a load of 14,100 pounds in laboratory tests.

The frame, yoke, reel, pawls, and tackle blocks are made of malleable iron. The hook in the main frame is made of forged steel. The pawls are controlled by springs, enabling the operation of the machine in any position, the company says. All models provided with a tackle block and hook at the end of the cable can be changed from single to double line by hooking to the end of the frame.

Some of the uses for these More Power pullers include: pulling pipe, stretching cable and wire fences, moving machinery, loading trucks and trailers with materials and equipment, pulling stumps, freeing mired vehicles, and moving freight cars and small buildings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

Soil-Cement Research

The use of bituminous materials to prevent moisture loss in soil-cement is covered in Research Report No. 8-F, published by the Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D.C.

The report summarizes the results of four field experiments conducted by the State Highway Departments of Illinois, Kansas, and Nebraska, and by the City of Little Rock, Ark., to determine the effectiveness of bituminous materials for retaining moisture in soil-cement for seven days following construction. The materials used included MC-2, RC-1, a negative Oliensis spot MC-3, and an asphaltic emulsion.

The experiments revealed that these bituminous cover materials effectively retain moisture in soil-cement, and that they produce satisfactory surfaces when penetration into the soil-cement is prevented by a suitable moisture in the surface at the time of bituminous application. Inferior surfaces are obtained when the bituminous materials are permitted to penetrate soil-cement and when no bituminous cover is used.

This report may be obtained by writing to the Highway Research Board. The price is 60 cents.

Catalog on Fasteners

A full line of fasteners including bolts, bridge hardware, highway guard-rail materials, nuts, pole-line hardware, rods, upsets and forgings, and washers is presented in the new catalog of the Lewis Bolt & Nut Co., 504 Malcolm Ave. S. E., Minneapolis 14, Minn. Full specifications, prices, and illustrations are given for each item. All standard features and special services offered by the company are also presented.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 52.

Rockwell Appointments

John Stolarz is now directing sales of Delta Multiplex radial-arm saws for the Rockwell Mfg. Co., of Milwaukee. His association with Rockwell followed his resignation, last year, as Sales Manager for DeWalt, Inc.

Irving G. Meyer, formerly District Sales Manager in charge of Rockwell's Pacific Northwest territory, has been appointed Consumer Sales Manager. He will direct the sales of Delta Homecraft and Delta-Milwaukee tools.

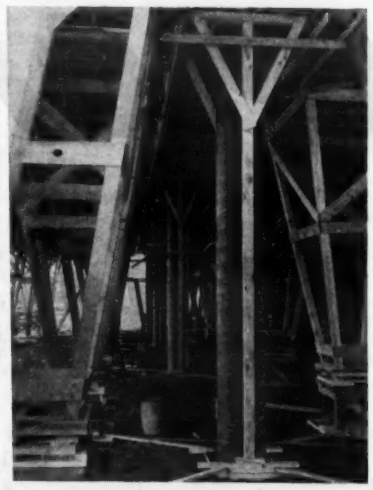
PERFECT CONCRETE PIERS and COLUMNS

Up to 24" in diameter

FASTER CHEAPER WITH Sonotubes PAT. APP. FOR. LAMINATED FIBRE TUBING

Specially treated for easy stripping

SONOTUBES are light and easy to work with. They arrive at the job ready to use and are cut to any desired length by hand-saw.



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or cause time out

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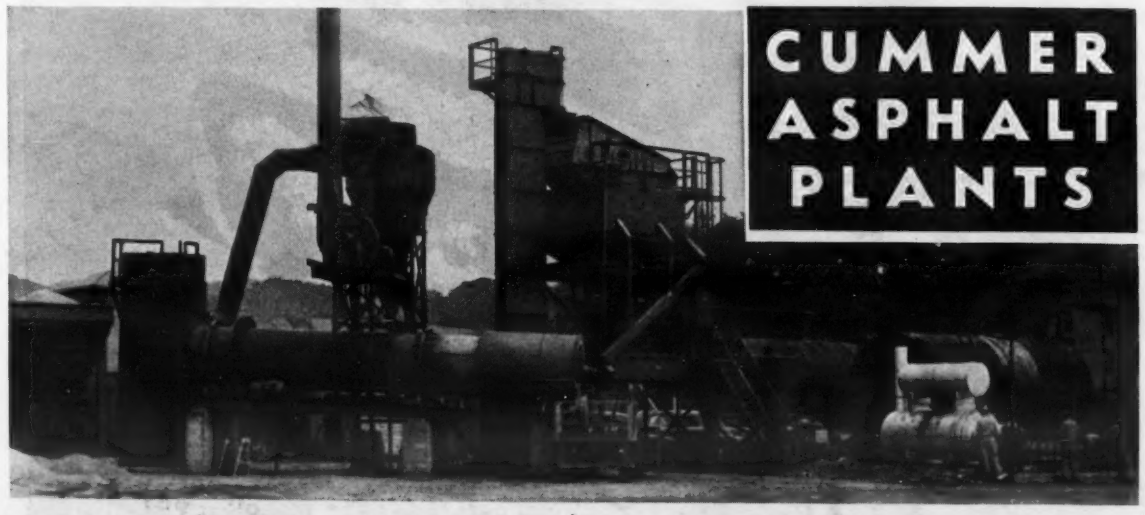

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PROMPT SHIPMENT OF ALL SIZES
Feeders — Storage Bins — Pumps — Timer
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BUILDER OF FINE ASPHALT PLANTS
Cleveland 15, Ohio USA

Plows Stand Ready For Drifting Snow

District Headquarters All Set Early for Annual Winter Fight In Montana's Snow Belt

✦ AT Bozeman, Mont., where equipment of last winter's famous "Operation Haylift" saw action, men and equipment of the Montana State Highway Commission were ready last August for another battle. Equipment was on the line. The men were optimistic because they did not believe last winter could repeat itself in another decade; the highways had been cleaned; roadsides mowed.

Like an infantry platoon prepared to go over the top, the crews stood eager and confident.

For the Bozeman district lies in the heart of the state's famous snow belt, which extends down into Yellowstone National Park. With a total of 387 miles of highways, most of which must remain open winter and summer, the district annually faces a snow fight far from pleasant.

Montana's recent reorganization of 11 division offices into 5 divisions, for the administration of construction work, does not affect the previous 11 maintenance districts, with the exception of a little mileage change in them. The Bozeman district picked up about 33 more miles in the shuffle.

The Snow Problem

Bozeman has always had a snow problem, ever since snow removal began. Highway 191 goes down to Yellowstone National Park, and for a distance of 21 miles passes through the Government-controlled area. The National Park Service provides summer maintenance, but snow plowing in winter is a function of the Bozeman office of the Montana State Highway Commission.

This entire corner around Yellowstone, in fact, is a bad snow belt. Montana State Highway 1, from Ennis southeast toward the park, always gets plenty. The highway through Gallatin Gateway into the park is another trouble spot.

The situation is complicated by two principal kinds of traffic. Winter sports enthusiasts, bound for the ski areas in West Yellowstone, throng the highways in the worst kind of weather. Heavy transport trucks with loads of petroleum products find Route 191 about 100 miles shorter to Idaho Falls than the highway through Butte and Dillon. Therefore the most vulnerable snow point on the Bozeman system usually gets the worst traffic. The only remedy is excellent snow-removal equipment and methods.

In the worst snowstorm in years last winter, a drift nearly 60 feet deep blocked a section of U. S. 191. The snow was solid, after drifting in so tightly, and it took a bulldozer and a Snogo rotary plow a week to clean it up.

Snow Equipment

Snow equipment is somewhat similar to that in most of the western states, where snow removal begins with push plows, goes on to V's and wings, and ends up with heavy rotaries. The snow-removal equipment is farmed out to strategic places before winter, and then moved around if necessary during emergency periods.

There are 12 one-way plows, mostly Wausau, Bros, American, and Baker. They all have standard mountings, and can be picked up very easily by the various trucks which use them. The trucks, of course, do other work connected with routine maintenance through the summer.

The 7 V-plows are Wausau, Ross, and American, and are used generally on heavy 4-wheel-drive FWD and Oshkosh trucks. They are useful in bucking the heavier drifts. There are 2 reversible plows—one an American, the other a Ross. The 11 wings in the district are Wausau, Frink, American, and Ross.

For the start of this winter's work, the district has one Snogo 2-auger rotary machine, but another of these machines is on its way. Despite the all-time record storms last winter, the district has not stampeded and equipped itself for record snows. Montana, the third largest state in the nation, is so large that it can usually shift equipment from one district to another if necessary. Catastrophes seldom happen on a statewide basis in a territory this large.

Snow Removal Methods

Snow removal at Bozeman aims to keep the white stuff moving when it falls. The one-way push plows get out immediately and start to work, followed by the heavier V's and the rotary, if necessary. Previous to the snow season, the right-of-way is cleaned to help the equipment as much as possible, and prevent the formation of drifts.

High winds often drift highways shut if the snow ridges are not bladed down. The wings come in handy here. But the bulk of removal is the responsibility of fast one-way plows on standard maintenance trucks.

The weather during the snow-re-

(*Concluded on next page*)

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OUT OF SAVINGS!
the FOOTE Kinetic mixer
UNUSUAL mixing principle means better coating of aggregate—less waste—faster output. Owners have reported savings as high as 50% per ton of asphalt.
Handles any mix—fully portable—turns out 3 cu. ft. in 30 seconds—built to give long service. Ask for Bulletin K-100.
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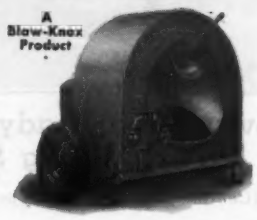

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CONSTRUCTION
IN THE EAST—Wickwire Spencer Steel Div. of C. F. & I., 500 Fifth Ave., New York 18, N.Y. • IN THE ROCKIES—The Colorado Fuel and Iron Corp., Continental Oil Bldg., Denver 2, Colo.
ON THE WEST COAST—The California Wire Cloth Corp., 1080—19th Ave., Oakland 6, Cal.

Montana State Highway Commission Photos

In the early days of the Montana Highway Department, snow removal was costly and inefficient (photo at left). Modern methods have corrected this condition. Now V-plows are used when snow piles up beyond the capacity of push plows as illustrated in the photo above.

Plows Stand Ready For Drifting Snow

(Continued from preceding page)

moval season is usually bitter, and one morning last winter during an emergency call at 4 a. m. it dropped somewhere between 41 and 50 below zero before the thermometers froze up. Snow fighting is tough business that kind of weather, but it never stops so long as there remains any snow on the highway. Interstate Route 10 passes through the Bozeman district, and it must be kept open at all costs.

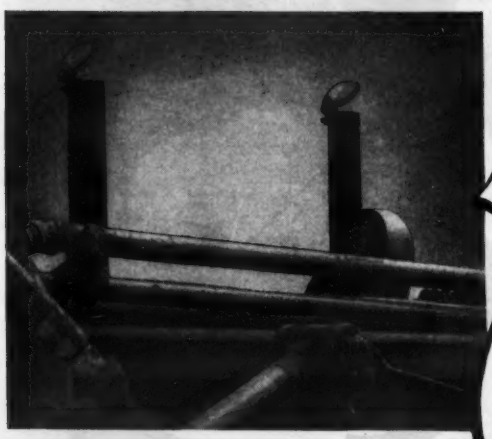
Ice from flooding rivers turned out to be as great a problem last winter as the record snowstorms. The ice formed all over the low-lying highways near the Madison River. Sand, sodium chloride, cinders, and all kinds of power equipment to scrape the ice off the pavement were used. As a rule Montana also stocks piles of salt-treated sand and cinders on the hills. Bozeman Pass, on U. S. 10, is such a spot.

Snow-removal equipment is maintained and serviced at its central field location, but in case of a major breakdown it is hauled in to the Bozeman equipment repair shop where the proper factory replacement parts are stocked. The equipment usually gets a heavy workout each winter, and is seldom lucky enough to stand through a mild winter and gather rust.

Each spring when the equipment is put away for the summer, it is thoroughly reconditioned, repaired if necessary, and painted ready for the next season.

Snow operations for many years have been under the general supervision of Ray Percy, Maintenance Engineer of the Montana State Highway Commission at Helena, with Fred Brown, another old-timer, as Division Engineer at Bozeman. Mr. Brown is retiring soon, and the division reorganization will include construction with the Butte division. Maintenance, including snow removal, will remain a district function, with George Barrett in charge at Bozeman as the District Maintenance Engineer.

CANCAP KEEPS OUT HARMFUL RAIN AND WEATHER



Light cast aluminum lid pops open as engine starts. No back pressure.

Lid closes as engine stops, snugly fitting over exhaust pipe sealing it against weather.

TRACTOR EXHAUST SYSTEMS NOW AUTOMATICALLY PROTECTED FROM DAMAGING RAIN, SLEET, SNOW

CANCAPS seal exhaust pipes from rain and weather, effectively protecting costly equipment from moisture damage. CANCAPS reduce maintenance and repair expense. Save you hundreds of times their cost. Made with a light weight, aluminum cap and cadmium plated bracket, CANCAPS provide quiet, long lasting protection. The lightweight cap completely overlaps pipe, yet provides a soft opening action with no back pressure. Simple construction permits easy installation. Just slip bracket over edge of exhaust pipe and tighten lock nut and it is on to stay. No fittings or bushings are needed. Fully automatic in operation, CANCAPS never forget, and whenever weather turns bad, your equipment is always protected.

Order a supply now for the winter season ahead. Direct or from your dealer.

Low Cost Protection— 3 Sizes Fit All Exhaust Pipes from 1¾" to 4¼"

No. 2 CANCAP—fits all exhaust pipes from 1¾" to 2⅜" . . .	$1.90 ea.
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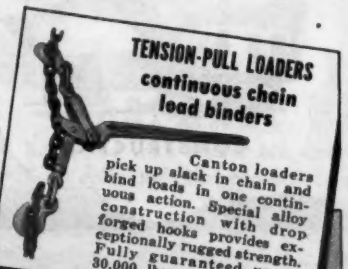

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continuous chain load binders

Canton loaders pick up slack in chain and bind loads in one continuous action. Special alloy construction with drop forged hooks provides exceptionally rugged strength. Fully guaranteed up to 30,000 lbs. capacity.

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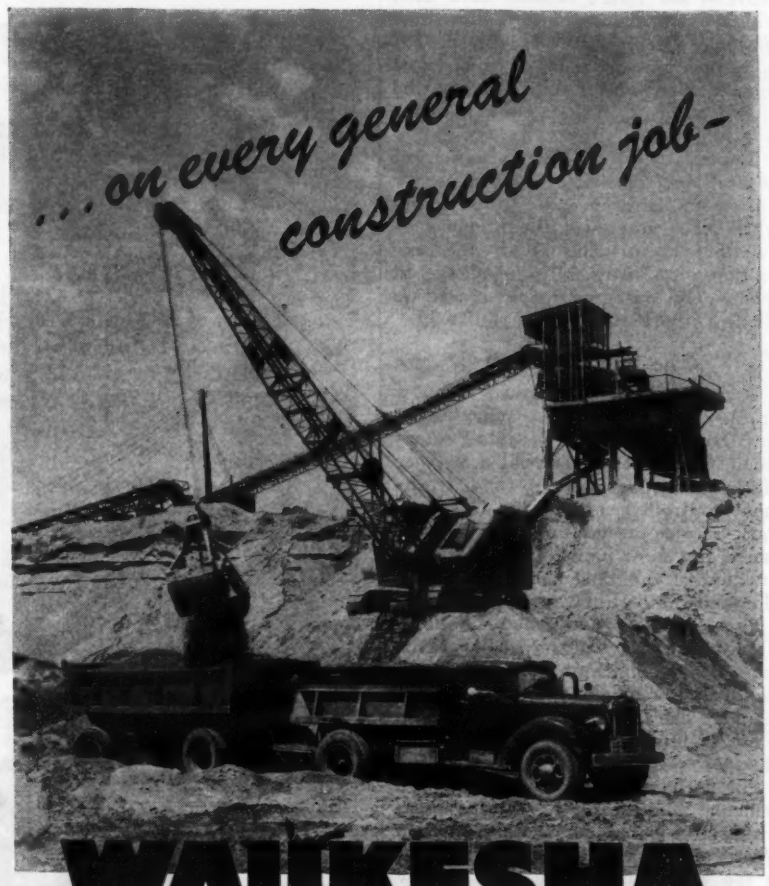
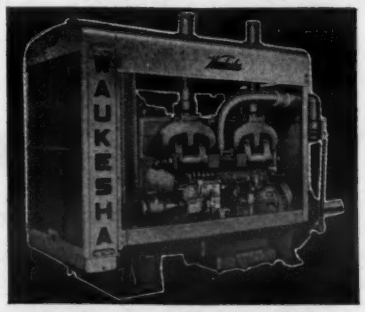


WAUKESHA *Diesel* POWER UNITS



WAUKESHA Super-Duty DIESEL (8-WAKDU) six cylinders, 6¼-in. x 6½ in., 1197 cu. in. displacement, 210 hp. maximum

WHY are Waukesha Diesels so specially adapted to the general contractor's needs—for powering rock crushing, gravel screening-washing machinery, conveyors, shovels, cranes, pumps, mixers, pavers, hoists, and portable compressors and generators . . .

Outstandingly lively pick-up . . . quick response to power demand . . . high economy . . . ability to burn cleanly all modern "high speed Diesel fuels" of 45 cetane or above . . . starts easily . . . runs smoothly . . . maintenance is simpler and costs less . . . and Waukesha Diesels are easy to understand and operate. They range all the way from the small four-cylinder with a maximum of 29 hp., to the largest six-cylinder with its 357 hp. maximum. Bulletin 1418 tells you how Waukesha builds dependability into these Diesels—send for it.

WAUKESHA MOTOR COMPANY
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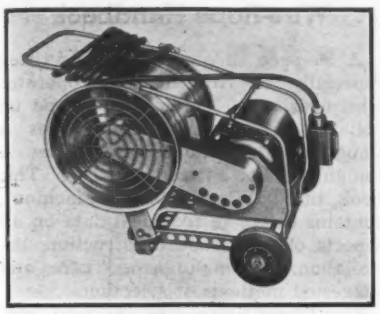

M. S. A.'s new portable ventilator provides ventilating and cooling air.

Portable Ventilator

New portable ventilators for use in high-temperature and noxious atmospheres have been developed by Mine Safety Appliance Co., Braddock, Thomas, and Meade Sts., Pittsburgh 8, Pa. Equipped with high-velocity fans powered either by gasoline or electricity, the new M.S.A. ventilators provide both ventilating and cooling air.

Air is conveyed to the desired point through a 14-inch-diameter 16-foot-long canvas duct. Ducts are treated for flame and mildew resistance, and when not in use can be collapsed and folded into a compact bundle. A two-way airflow feature permits the duct to be connected to either the inlet or discharge side of the fan—allowing dust or noxious gases to be drawn from the area, or fresh ventilating and cooling air supplied to the area.

The M.S.A. portable ventilators may be used for exhausting gases and vapors, removing fumes from welding operations, and withdrawing dust during sandblasting, cement unloading, plaster chipping, and other operations incident to construction work. The gasoline belt-drive model is designed to supply 4,000 cfm with the duct attached, 4,800 cfm without. The direct-drive electric model is designed for 3,300 cfm and 3,800 cfm.

Further information may be secured from the company, or by using the Request Card bound in at page 16. Circle No. 25.

Concrete-Pipe Construction

A 26-page catalog and price list on Quinn concrete-pipe construction is available from the Quinn Wire & Iron Works, 1623 Twelfth St., Boone, Iowa. It describes and illustrates the various Quinn concrete pipe forms and tabulates standard dimensions of various types of concrete pipes. Detailed information is given on the jackets, cores, pallets, and headers for heavy-duty and medium-duty forms for sewer and culvert pipes.

Tables indicate specifications, weights, size of wire, and spacing necessary to obtain the area of steel, together with the weights of wire fabric, cost of wire fabric per foot of pipe, and cost of wire per ton of concrete. Also given are the strength requirements using the 3-point bearing test as outlined in ASTM specifications C75-41 for sewer pipes and C76-41 for culvert pipes. These tables are designed to give estimated costs of producing all sizes of reinforced-concrete pipes in Quinn pipe forms. Additional tables and charts indicate comparative capacities of corrugated-metal and concrete pipes.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 103.

Literature on Excavators

Literature on ¾-cubic-yard gasoline or diesel-powered excavators is available from The General Excavator Co., P. O. Box 515, Marion, Ohio. This size of unit, designed for shovel, dragline, clamshell, crane, and back-hoe work, is available in three models: the crawler-mounted Model 310, the truck-mounted Model 312, and the Mobilcrane Model 315. The catalog points out that the excavator has a shovel boom length of 18 feet 8 inches, a shovel dipper-handle length of 16 feet, and a standard crane-boom length of 35 feet. The crane's lifting capacity indicated is 23,800 pounds for the crawler-mounted and 40,000 pounds for the tire-mounted models.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 88.

Diesel-Engine Bulletins

Four bulletins on the Model 4FS-1 one-cylinder diesel engine have been prepared by Nordberg Mfg. Co., Chase and Oklahoma Aves., Milwaukee 7, Wis. These bulletins, Nos. 166, 167, 167-A, and 168, give specifications, detailed information, and outline drawings of Nordberg diesel engines as adapted to power take-off, with and without clutch; generating units; and pumping units.

These four-cycle diesels are rated at 15 hp at 1,800 rpm and 10 hp at 1,200 rpm. They are compact power packages built to provide a dependable source of power over a range of applications. The units are available for hand and electric starting.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 76.

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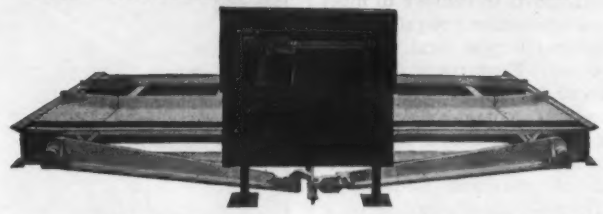
"THE CONTRACTORS' SPECIAL SCALE"



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Capacities: 15-18-20-30 Ton—Write us for your nearest distributor

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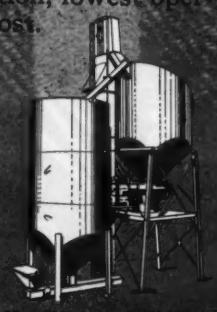
BUTLER Thrift-Equipment for 1950 PROFITS!

Central Mixing Plants
Engineered for peak production, lowest operating cost.

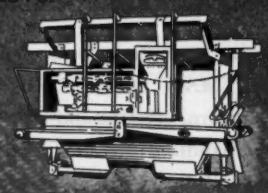
Ready Mixed Plants
From small units to the world's most automatic.

Aggregate Plants
For the busy roadbuilder who is always on the move.

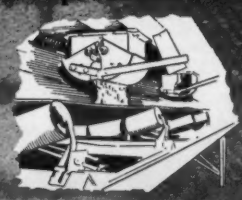


Bulk Cement Plants
Tops in portability coupled with high speed batching.

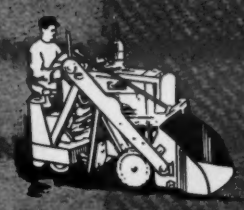
Concrete Block Plants
Butler engineers have a remarkable "know-how" in planning the most efficient production.



Weighing Batchers
Many smart features make Butler Batching equipment the wise and economical choice.



Butler Bin Gates
Next time replace with long-lived gates of Butler design. How about some now as a "reserve" against emergency?



Butler Carscoop
Agile, dextrous and quick, it's the world's fastest boxcar unloader.

BUTLER BIN COMPANY

WAUKESHA, WISCONSIN

A Portable Crushing And Screening Plant

A new Rock-It crushing and screening plant for chip and road-stone work has recently been developed by the Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa. Capacities for this unit, the company says, range from 60 to 80 tons per hour. The Rock-It is a portable plant; the only parts to remove to meet highway transportation requirements are the charging hopper and the delivery conveyors. Features of the plant include: accurate gradation of the finished product, centralized controls, low feeding height for shovel feed, and anti-friction construction.

Made up of standard Cedarapids units, the Rock-It plant consists of a 24-inch x 8-foot apron-type feeder and charging hopper with grizzly; a newly designed roller-bearing jaw crusher with an 18 x 24-inch jaw opening and jaws of standard thickness; a 42-inch x 10-foot horizontal vibrating ag-lime screen; a Cedarapids hammermill, either 3033 or 2033; and a return wheel system of monorail design. The company states that a 3018 roll may be used in place of the hammermill and that a 2025 primary crusher may be used in place of the 1824.

Further information may be secured from the company by requesting Bulletin RIP-1. Or use the Request Card at page 16 and circle No. 106.

Catalog on Equipment For Concrete Placing

A 10-page condensed catalog on concrete-placing equipment has recently been issued by the Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles, Calif. Bulletin No. 78-B describes and illustrates buckets, hoppers, chutes, hand and power carts, wheelbarrows, tower buckets, and bin gates.

Gar-Bro heavy-duty buckets for dry concrete are built in six sizes, ranging from ¾ to 8 cubic yards. Lightweight buckets for normal-slump concrete, where the concrete is to be elevated with light cranes, are made in ½, ¾, and 1-yard capacities. The condensed catalog presents 5 of the 25 different barrows made by Gar-Bro. These barrows are available with either steel or aluminum trays.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 150.

The Rock-It portable crushing and screening plant handles chip and road-stone work.

New Officers and Offices For Concrete-Cutter Firm

Concrete Sawing Equipment, Inc., manufacturer of Concut, Jr., and Clean-Cut concrete-cutting machines, announces the withdrawal and resignation of Hurst Lewis and E. S. Lewis as directors and officers of the company. Harold F. Pettee, Jr., has been elected President, John I. Bolen Vice President, and Raymond P. Massey Secretary-Treasurer.

The general offices of the company have been moved to 200 Union National Bank Bldg., Colorado and Oakland Sts., Pasadena 1, Calif.

Pneumatic-Tool Catalog

A fully illustrated 48-page catalog describing a complete line of pneumatic tools is now offered by the Keller Tool Co., of Grand Haven, Mich. The products described in the booklet include rotary tools, vertical piston tools, grinders and sanders, chippers, riveters, rammers, compression riveters, air hoists, and tool accessories. Applications are suggested and specifications indicate the tools' free speed in rpm, dimensions, weights, etc.

This literature may be obtained from the company, or use the Request Card at page 16. Circle No. 75.

Wire-Rope Handbook

A 96-page illustrated book, written especially for the machine operator who constantly handles wire rope on his job, is available from Jones & Laughlin Steel Corp., 411 Jones & Laughlin Bldg., Pittsburgh 19, Pa. This book, titled "Wire Rope Is a Machine", contains complete technical data on all aspects of wire-rope construction, installation, use, maintenance, care, and suggested methods of selection.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 2.

Trojan Representative

Joe R. Hames, a native-born Texan, is now representing Contractors Machinery Co., of Batavia, N. Y., in the southwest. In his new position, he is serving distributors of Trojan road tools in Texas, Louisiana, Mississippi, western Tennessee, Oklahoma, Arizona, and New Mexico.

HANDLES ALL DIRT MOVING JOBS EASIER

Midwest Hydraulic Scoopmaster

A few good jobber territories now open

ONLY 15 H.P. DRAW BAR PULL REQUIRED

One lever handles the loading, dumping, carrying, or spreading. Works easily around buildings. Ideal for soil conservation work and landscaping – builds terraces, dams, ponds, roads, etc.

It Loads -- It Carries -- It Dumps Without Stopping

(No Preliminary Breaking of the Soil is Necessary)

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MAQUOKETA COMPANY MAQUOKETA 2, IOWA

GETMAN'S New SCOOT-CRETE

There are countless applications for the GETMAN SCOOT-CRETE, the most modern, efficient and economical way of handling bulk materials. Has maneuverability with caster steering, large heavy-duty tires for traction to move a load over any surface. Built rugged for day in and day out service, and when it's time to stop, the SCOOT-CRETE has brakes that HOLD. So if you want to drastically cut cost in materials handling, go the GETMAN way—see SCOOT-CRETE today!

Getman Bros. Mfg. Div.

South Haven, Michigan

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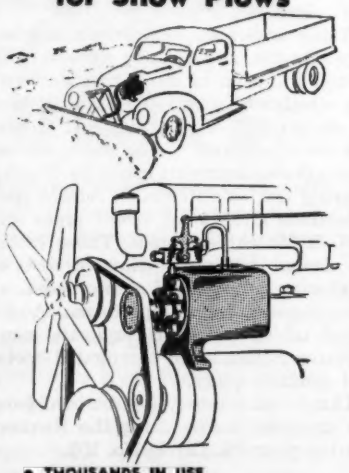

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- FAN BELT OR ELECTRICALLY DRIVEN MODELS.
- *Write Hydraulic Division*

MONARCH ROAD MACH. CO.

323 North Front Ave., Grand Rapids 4, Michigan

The Red Cross Carries On!

GIVE!

With its shorter overall length, the Lo-Head crane block permits 1½ to 2-foot-higher lifts without lengthening the boom. It comes in capacities of 10 to 50 tons.

New Crane Block

A new American Lo-Head crane block, in capacities from 10 to 50 tons, is now available for all types of hook work. With its shorter overall length, it permits 1½ to 2-foot-higher lifts without lengthening the boom, points out the manufacturer, American Hoist & Derrick Co., St. Paul 1, Minn.

The forged hook operates on Timken tapered roller bearings, and the cast-steel sheaves are equipped with Hyatt Hi-Load bearings. Lubrication is necessary only once each 2,000 hours. Alemite fittings are provided for standard grease-gun use.

A 4-page catalog containing complete data and prices may be secured direct from the company. Or use the Request Card bound in at page 16. Circle No. 32.

Automatic Boom Stop

Serious and costly accidents may occur when a boom is pulled to a dangerous elevation. The automatic safety Boom-Stop control manufactured by the Davenport Ever-Ready Boom-Stop Co., Mountain Home, Ark., is designed to shut off boom power when this danger point of elevation is reached.

The Boom-Stop trigger box attaches to the cab frame (either by welding or by two bolts) directly in line with the boom, so that it will trip the trigger if the boom is raised beyond its safe limit. The control box is installed near the master clutch. When the danger point of elevation is reached, the boom contacts the trigger and causes it to trip. This actuates the Boom-Stop control arm which disengages the master clutch. The length of trigger determines the elevation at which the boom will be automatically stopped. The elevation is optional since any length of trigger can be supplied.

Resuming operation, the operator merely shifts the boom clutch to the lowering position and holds the master clutch in against tension of the Boom-Stop control springs until the boom has lowered enough to allow resetting of the control. This is done by pulling the reset cable, and operations can be resumed in a few seconds, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 78.

Form Clamping and Tying

A folder, SA21, about accessories for reinforced-concrete construction and form clamping and tying devices is now offered by the Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill. The first page is devoted to the Uni-Form system, its features and standard constructions. The rest of the catalog deals with a variety of accessories, including slab bolsters, chairs, form clamps, anchors, rod pullers, tightening wrenches, and other clamping and tying devices. The folder highlights the Twistye, a combination form tie and positive spreader.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 8.

Movie on Stud Welding

"Split-Second Fastening", an 18-minute color sound movie, explains the method of end-welding fasteners to steel, and shows how stud welding may be used on corrugated roofing and siding materials, steel roof decks, and in the installation of piping, electrical equipment, and other building materials.

Interested groups can arrange for bookings by writing to Nelson Stud Welding Division, Lorain, Ohio, or through the company's local distributors.

Hi-Lo
CONCRETE TRANSPORT MIXER CO.
TRUCK MIXER
Hi-
DISCHARGE
PRODUCTION
SPEED
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Revolutionary Truck Mixer Design

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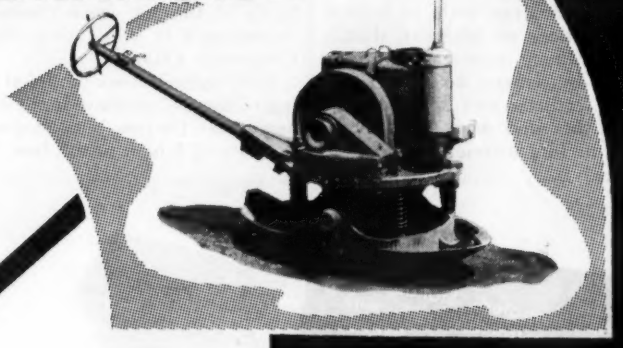
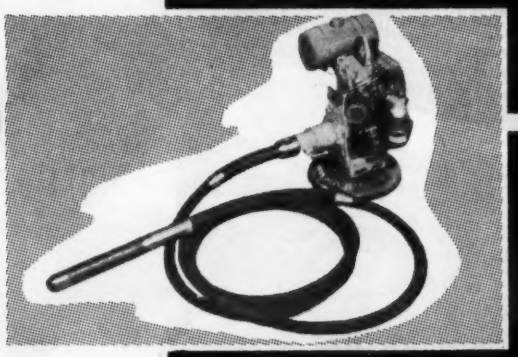
VIBRO-PLUS means
PRECISION VIBRATION
Precision vibration means more efficiency, dependability, superior performance and lower costs.
For example, Vibro-Plus "TERRAPAC" Soil Compactor will give 95% compaction down to a depth of 3½ feet in 3 to 5 passes, (depending upon the soil) — used for compacting highway and railroad embankments, backfills, earth dams, etc.



PRECISION VIBRATION FOR CONCRETE CAST IN PLACE OR PRE-CAST
"Rollgear" Vibrator
• Has higher frequency than any other vibrator on the market.
• Will outlast any common type vibrator.
• Has definitely proven to be superior to any other vibrator.
"Topdog" Vibrator
• Lighter in weight with a heavier kick than any other vibrator.
• Made to be adaptable for all kinds of concrete forms.
• Can save more than 75% of form costs.
• Saving of a bag of cement per cubic yd. of concrete.
ATTENTION A. E. D. MEMBERS

At the convention, a company representative will be present to discuss any phase of our business with you.
To insure a superior concrete product, utilize Vibro-Plus equipment and know-how.
Consult us about your particular problem in vibration. A trained force will be at your disposal to assist you in every way.
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C. & E. M. Photos

The Judson spreader above is spreading high-nitrogen commercial fertilizer on the shoulders of U. S. 23 near Chillicothe, Ohio. The seed is sown with a Cyclone seed spreader operated by Charles Keek (right), Foreman.

Machines Speed Shoulder Seeding

Straw Mulch Incorporated Into Soil Eliminates Pegs And Twine on Roadside Improvement in Ohio

+ ROADSIDE improvement work in Ohio was speeded up considerably this past season with the introduction of equipment on a large scale to handle seeding operations on highway shoulders. Pulvi-Mixer machines were in general use by several contractors to incorporate fertilizer and lime into the soil before the seed was sown. They were used in like manner with straw mulch, thereby eliminating the peg-and-twine method of holding the mulch in place. This machine operation was a distinct improvement over the slow and laborious hand procedure of driving pegs and crisscrossing twine around them.

A typical example of the mechanization of seeding work was illustrated on a 2½-mile project on U. S. 23 in Ross County north of Chillicothe in south-central Ohio. The Ohio State Department of Highways has awarded a contract for the widening from 20 to 24 feet, and the resurfacing of this stretch to Brewer & Brewer's Sons, Inc., of Chillicothe. The roadside improvement features of the job were given under a subcontract to the Tucker Sod Co. of Cincinnati, Ohio.

The roadside work included the seeding of the 6-foot shoulders which slope away from the new black-top surface at the rate of 1 inch to the foot. The area involved totaled 17,134 square yards, requiring 615 pounds of seed; 3,076 pounds of fertilizer; and 15,383 pounds of limestone. The seeding was done in mid-September.

A Machine Job

After the pavement was completed and the shoulders were graded and shaped, the Tucker Sod Co. began its work. First, agricultural ground limestone was spread over the shoulders at the rate of 100 pound per 1,000 square feet. This was followed by the spreading of a high-nitrogen commercial fertilizer, 10-6-4, at the rate of 20 pounds per 1,000 square feet. This sequence of materials was also reversed with the fertilizer preceding the limestone, as it was of no consequence which was spread first. The spreading was done with a Judson spreader—a box with a closed top and a rubber-tired wheel at each end—pulled by an International Super A rubber-tired tractor.

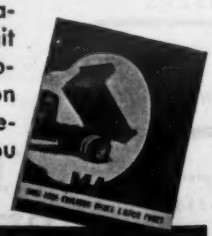
Following closely behind this operation, as soon as the spreading was finished, came a Seaman Triple Tiller Pulvi-Mixer powered by a Waukesha engine and pulled by the rubber-tired tractor. The tines on the machine were set to a 4-inch depth, and their work-

(Continued on next page)

Model Illustrated: Standard 3 cu. yd. contractors body with running boards, side braces and half-roll cab protector. Mounted over Marion model 721A hoist.

There's More Pay Load in "On The Job" Design

Extra pounds on every trip . . . faster loading and unloading . . . fewer lay-ups in the repair shop . . . longer service life under the toughest hauling conditions. These extra-profit features are built into every Marion unit by engineers who study special hauling problems right *on the job*. Ask your nearest Marion Distributor about a Marion Body and Hoist designed under the actual working conditions you face. Or write direct.



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DUMP BODIES and HYDRAULIC HOISTS

GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

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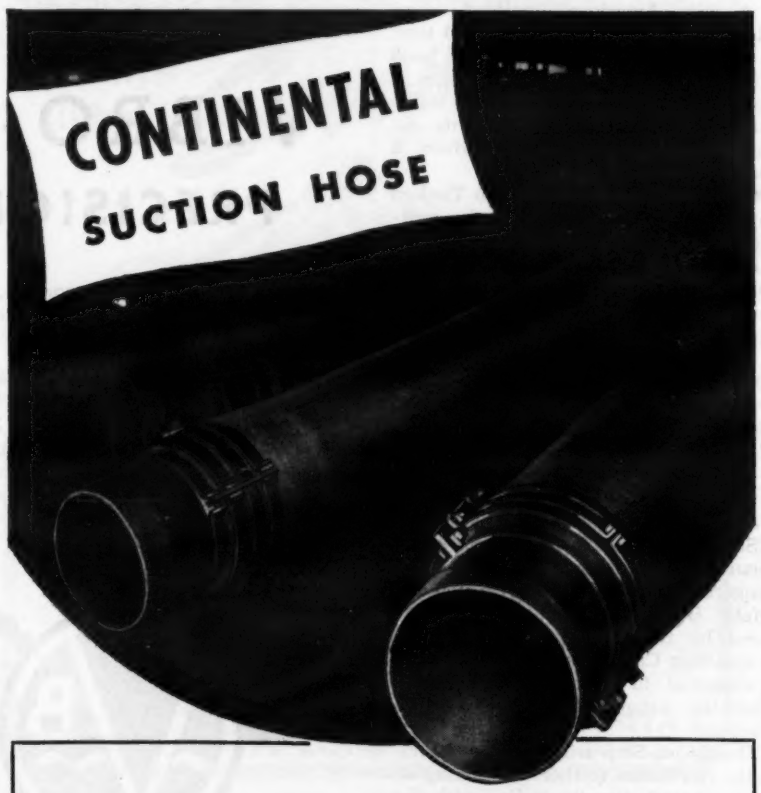

Continental Warehouse Service Helps You Keep the Job Moving!

When you need suction hose in a hurry, consider the advantages of Continental's near-at-hand branch warehouse facilities. These factory warehouses, listed below, carry large stocks of hose for every requirement. They're located within reasonable telephone and delivery range. In short, they're equipped and situated to give the prompt, dependable service that helps you keep the job moving—that protects your profit in a job. Get acquainted *now* with Continental Warehouse Service.

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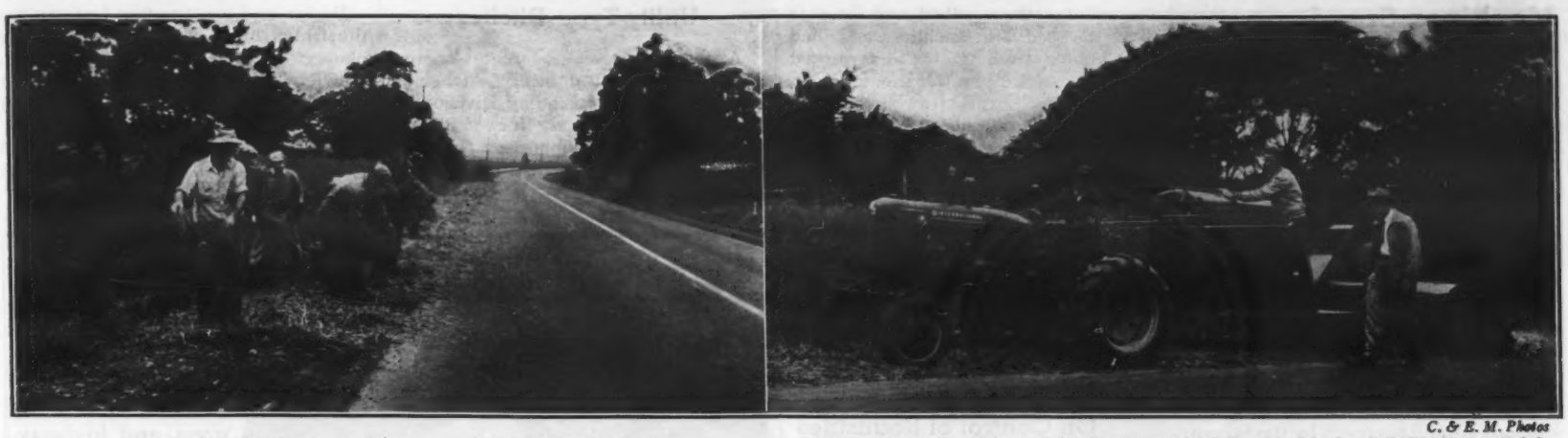


C. & E. M. Photos

Straw mulch on the Ohio roadside development job is spread by hand (left); then a Triple Tiller Pulvi-Mixer (above) throws enough dirt on top of the straw to hold it in place. Foreman Keek operates the Pulvi-Mixer, while Henry L. Minert, Ohio Division 9 Landscape Architect, checks the work.

ings incorporated the fertilizer and limestone into the upper soil layer of the shoulders. The machine also broke up any surface crust and prepared a receptive seedbed for the sowing that followed.

Seeding was done by the foreman using a Cyclone seed spreader as he walked along the shoulder at a measured pace, and turning the hand crank at a speed that spread the seed at the rate of 4 pounds per 1,000 square feet. A single pass accounted for the full 6-foot width of shoulder. Some seed was purposely sown on top of the edge of the pavement, but this was quickly blown off by the heavy traffic using this highway. The seed thus moved accumulated directly along the edge of the pavement, thus providing a thicker stand of grass where it is most needed.

The seed mixture used was as follows:

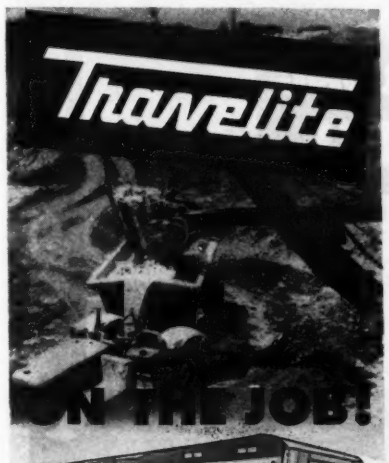
Kentucky bluegrass	50 per cent
Perennial ryegrass	15 per cent
Alsike clover	20 per cent
Hairy vetch	15 per cent
	100 per cent

Mulching Operations

After a section of shoulder was seeded, the tractor pulled a strip of woven-wire fencing material over the sown area. This acted like a rake, covering the seed with a thin layer of soil from ¼ to ½ inch in depth. The light cover of dirt over the seed not only helped with the germination, but also kept the seed from blowing away until the protecting mulch was put on.

Straw purchased from neighboring farmers was used as a mulch. It came in rectangular bales, 50 to 60 pounds in weight, and was scattered over the

(*Concluded on next page*)



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Heavy Duty Trailer Coaches Built To Your Specific Requirements

Let us tell you how other companies in your field have successfully used Travelite Trailers in solving their on-the-job personnel problems. Write for details.

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Contractors are saving with Preformed "Blue Center" Wire Rope

WHEN YOU ASK "HOW LONG," don't think merely of a rope's length; think of how long it will stay on the job! The rope that lasts longest, costs you the least . . . and that's why contractors are turning to Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" Steel – made only by Roebling – gives wire rope *extra* ability to withstand strain, abrasion and shock loads.

PREFORMED SPEEDS OPERATIONS, TOO. Roebling Preformed saves handling and installation time because it is not inclined to set or kink. You can cut it without seizing, and there's less trouble in applying fittings. In operation, Preformed is largely free of vibration and whipping . . . gives top performance despite severe bending, small sheaves and reverse bends.

FREE ENGINEERING SERVICE. Have your Roebling Distributor help choose the *right* wire rope for genuine economy on your equipment. If you have any special problems in the selection, installation or maintenance of wire rope, your Distributor will promptly get the assistance of a Roebling Engineer. John A. Roebling's Sons Company, Trenton 2, New Jersey.

WRITE OR CALL THE ROEBLING FIELD MAN AT YOUR NEAREST ROEBLING OFFICE AND WAREHOUSE

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ROEBLING
☆ A CENTURY OF CONFIDENCE ☆

Machines Speed Shoulder Seeding

(*Continued from preceding page*)

shoulders by hand to an even depth of 2 inches, loose measurement, or about 2 pounds to the square yard. The mulch was at once incorporated into the soil with the Triple Tiller that threw enough dirt on top of the straw to hold it in place and keep it from blowing away. The tines on the machine, for this operation, were set at a 2-inch depth. As before, it was towed by the tractor, and accounted for the full 6-foot shoulder with a single pass. The straw was put on only from 200 to 300 feet ahead of the machine so that it was not whipped around too much by the breeze from the fast-moving traffic.

In this manner the straw was securely held in place until the seed had taken hold in the ground. The former slower method of driving stakes, nails, or pegs in rows along the shoulders and weaving a pattern of twine on top of the straw to hold it down was eliminated. The freshly turned dirt spread through the straw also helped to eliminate the fire hazard to a great extent caused by passing motorists discarding cigarette butts on the dry straw.

Time-Saver

The seeding of the shoulders on this 2½-mile job was done in 2½ days of 10 hours each, actual working time, or a total of 30 hours. The Tucker Sod Co. used a crew of 10 with Charles Zeek as Foreman.

For the Ohio Department of Highways, the roadside improvement features of the contract were supervised by Henry L. Minert, Division 9 Landscape Architect, and Karl Orr, Inspector. Wilbur J. Garmhausen is Chief Landscape Architect of the Department which is headed by T. J. Kauer, Director of Highways.

The units of roadside development under contract in Ohio during 1949 included 292.679 miles of highway, calling for 9,517,671 square yards of seeding, 1,470.34 tons of agricultural ground limestone, and 837.03 tons of fertilizer (mostly 10-6-4).

Altogether this past season, contractors engaged in roadside improvement work used eight machines of the Pulvi-Mixer type in seeding and mulching operations in the state of Ohio. On one project the roadside subcontractor employed an agricultural weeder to loosen the soil for the seedbed and later to cover the seed. The machine was pulled by a rubber-tired tractor and worked the slopes as well as the shoulders.

On some jobs the straw mulch was spread by machine instead of by hand. The machine was a straw blower, an ensilage cutter from which the knives had been removed.

The increasing use of machines in this roadside improvement work enables such projects to be completed more quickly than if hand labor alone were employed. The results are more uniform, usually better, and the work can be done at lower costs.

BPR Issues Bibliography On Control of Roadsides

A bibliography of the significant material that has been published since 1930 on roadside control has been prepared by the Bureau of Public Roads, Department of Commerce, Washington, D.C. Section 1 contains general references on the subject as a whole. Section 2 concentrates on outdoor advertising—in general, and by states. Building set-backs and buffer strips are treated in Section 3—in general and by states. And roadside zoning is the topic of Section 4. The contents of each book or article are summarized briefly.

This bibliography was compiled by Frances Monis of the Land Studies Section of the BPR, from material found in the Bureau library and files. Copies can be secured from the BPR by highway engineers and administrators for official use.

Civil Service Exam For Highway Engineers

Examinations have been announced by the U. S. Civil Service Commission for Highway Engineer Trainee, Highway Engineer, and Highway Bridge Engineer. These positions, which pay from $2,650 to $3,825 a year, are mainly in the Bureau of Public Roads of the Department of Commerce in Washington, D.C., and throughout the country. A few positions may also be filled outside the United States.

Further information and application forms may be obtained from most first and second-class post offices, from civil service regional offices, or from the U.S. Civil Service Commission, Washington 25, D.C. Applications must be received in the Commission's Washington office not later than February 8, 1950.

Utility-Type Ditcher

A new 8-page color bulletin on the Buckeye Model 306 utility ditcher is announced by The Findlay Division of Gar Wood Industries, Inc., Findlay, Ohio. The folder emphasizes the features of the ditcher and lists its varied applications.

Design and construction features are illustrated by drawings, diagrams, and photographs of the digging wheel, crawlers, controls, power plant, hoist mechanism, etc. Full specifications of the Model 306 are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 58.

SWENSON MATERIAL SPREADER

"It crushes as it spreads"

An all purpose, self-feeding, cab controlled unit for street and highway work.

Spreads at any speed, forward or reverse.

It is tops for ice control and seal-coating.

Accurately applies any granular material, salt, cinders, sand, rock chips, etc., from a sprinkle to any depth desired.

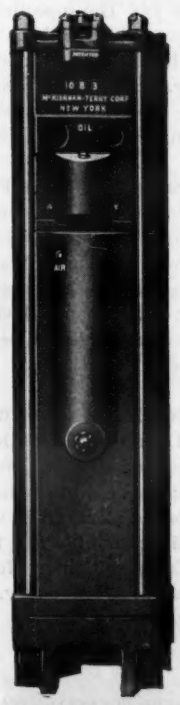
Leading highway engineers recommend and constantly reorder these simple, easy to attach units. Write for complete information.

SWENSON SPREADER & MFG. CO.

Cherry Valley, Illinois

DRIVING EXTRA-LONG TUBULAR PILES

These 75-foot tapered, fluted, tubular piles with 20-foot extensions were driven to a minimum bearing of 40 tons each by a McKiernan-Terry No. 10-B-3 Double-Acting Pile Hammer, in constructing the new highway bridge at Spring Lake, Mich. Luedtke Engineering Co., contractors.



To insure accurate driving, as well as protection from damage during driving, a McKiernan-Terry Hammer was the contractor's choice for handling these long, costly piles.

For through the past fifty years, whether for driving timber, steel sheet, concrete or pipe piles, contractors have more and more grown to depend upon these powerful, safe-to-operate hammers to "deliver the goods".

There are ten double-acting hammers, five single-acting hammers and two double-acting pile extractors in the standard McKiernan-Terry line. This makes possible always the selection of a right hammer or extractor for any specified pile-handling conditions.

ALSO MADE BY McKIERNAN-TERRY. The same engineering and manufacturing skill that has made McKiernan-Terry Pile Hammers so outstanding in the field of construction is applied also to bulk material unloaders, coal and ore bridges, marine equipment, cranes, bridge operating mechanisms and other important machinery of service to industry, railroads and the government.

WRITE FOR DATA. For handy reference in your files, let us send you latest literature giving full information, specifications, examples of pile-driving jobs. Send now, on your business letterhead.

MK-270 A

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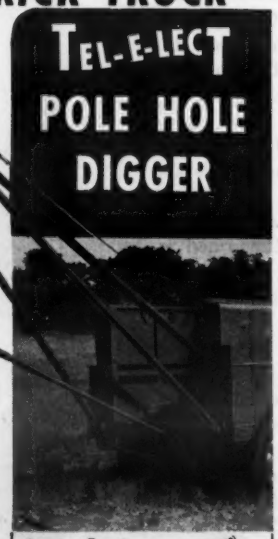
McKiernan-Terry PILE HAMMERS AND EXTRACTORS

***Operates* ON ANY DERRICK TRUCK**

- Adjustable for clean holes to 10 feet deep
- Interchangeable augers 8" to 20" diameter
- Drills a straight hole from any truck position
- Easy to use—easy to transport

TEL-E-LECT POLE HOLE DIGGER



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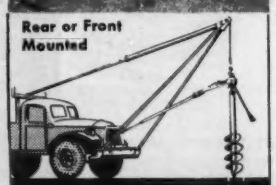


With the Tel-E-Lect Digger, you can drill a hole for any purpose—*anywhere you can spot a truck derrick.* Used by contractors for drilling telephone and power poles... pier holes for buildings ... guard rail post holes... many other uses. A single bolt attaches the digger to the truck and it works suspended from the derrick line. Powered by the truck motor through a power take-off shaft, the Tel-E-Lect is raised and lowered by the winch line. A low cost all-purpose digger. *Ask for circular.*

TEL-E-LECT PRODUCTS, Inc.

19,933 Minnetonka Boulevard, Minneapolis 16, Minnesota

Distributor Doings

Vibrator Dealerships Still Open

Dealers interested in handling a line of concrete vibrators — heavy-duty jackshaft and light direct-drive models —should contact Frank D. Messenger, P. O. Box 124, Fair Haven, Mich. The company announces that a few exclusive dealerships are now available.

Crater Lake Is New Caterpillar Dealer

According to a recent announcement by Caterpillar Tractor Co., Peoria, Ill., Crater Lake Machinery Co., of Klamath Falls, Oreg., has succeeded Reed Tractor & Equipment Co. as Caterpillar distributor in south-central Oregon and portions of California. Nelson Reed, former owner of the Reed company, is retiring from the field after many years of service.

Stanley Miller is President of the Crater Lake company; G. C. Lorenz is its Vice President-Treasurer; and Reuben Larson is Secretary and Sales Manager. The territory to be served will comprise the counties of Crook, Deschutes, Lake, Klamath, Jackson, and Josephine in the state of Oregon; and in California, Modoc County and portions of Siskiyou and Lassen Counties.

Handles South Bend Units, Calif.

From its offices in Redding, Sacramento, Fresno, and San Francisco, the Coast Equipment Co. is now selling and servicing road maintenance equipment made by the Municipal Supply Co. of South Bend, Ind. The South Bend line includes a bituminous distributor and bituminous maintenance unit, a gravity sprinkler, the Big 6 street flusher, and the Gutter-Snipe street sweeper.

Cylinder Dealers on East Coast

Austin-Hastings Co., Inc., of Cambridge, Mass., is the exclusive representative for Hydro-Line air and hydraulic cylinders and special machinery in all the New England states except Connecticut. Hydro Pneumatics, Inc., of New York City has the same assignment in metropolitan New York and northern New Jersey.

Galion Appoints New Distributors

The Galion Iron Works & Mfg. Co., Galion, Ohio, has appointed two new distributors for its motor graders and rollers in the states of Mississippi and Idaho. Road Materials & Equipment Co., Inc., Jackson, Miss., covers all counties in that state except those north of Bolivar, Sunflower, Leflore, Carroll, Montgomery, Webster, Clay, and Lowndes Counties.

Western Equipment Co., Boise, Idaho, represents Galion in all counties of Idaho south of Idaho County; in the Oregon counties of Wallowa, Baker, Union, and Malheur; and in Teton County in Wyoming.

Handles Diesel Engines in Wyoming

Colorado Builders' Supply Co., of Casper, Wyo., is now handling General Motors Series 71 diesel engines in all of Wyoming except Teton, Lincoln, and Uinta Counties. The company has been a Colorado distributor for the Detroit Diesel Engine Division for two years, working out of its headquarters in Denver. Its Casper facilities include a well equipped shop for diesel service and parts work, and a new 50 x 100-foot warehouse now under construction.

Cobusco represents a number of other well known construction equipment firms, including Bucyrus-Erie, Ingersoll-Rand, and R. G. LeTourneau.

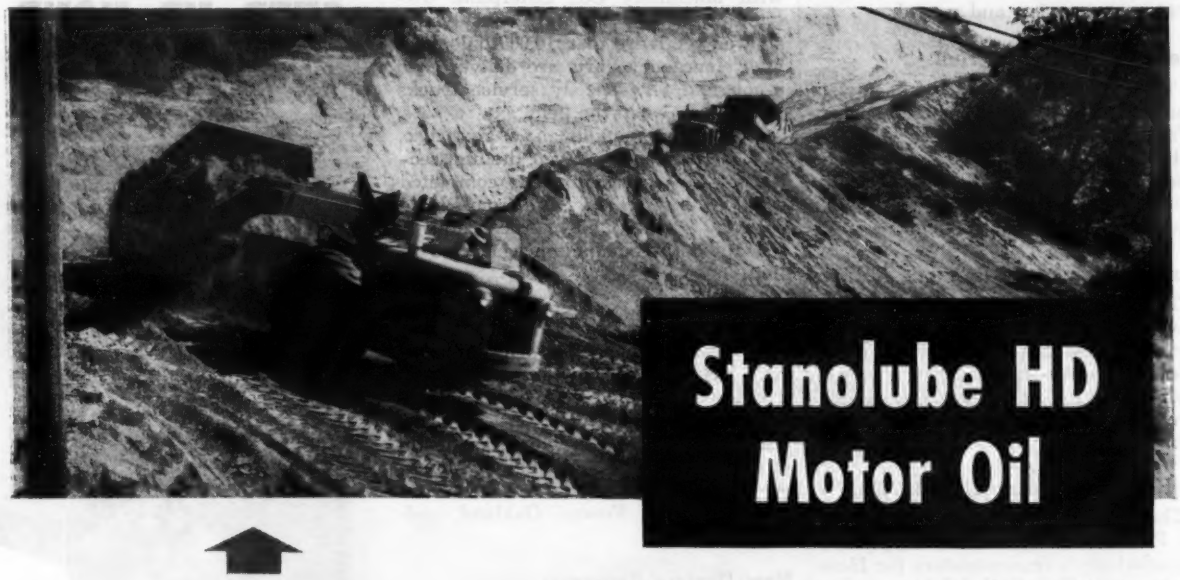
Service Supply—Austin Supply Stage Barbecue for Constructors

Some 1,000 contractors, equipment operators, construction superintendents, and mechanics attended the First Annual Constructors' Barbecue staged October 29 by Service Supply Corp. and Austin Supply Co., Philadelphia construction-equipment distributors.

In between swallows of beer and mouthfuls of beef, the visitors watched dramatic work demonstrations with International TD-24's, Adams 610 motor graders, Hough HM Payloaders, Jaeger compressors and Hoister-Towers, and Gradalls. They observed safety tests performed on Ezebilt steel scaffolding

(*Continued on next page*)

Harry E. Shaw, President of Service Supply Corp., welcomes construction men of the Philadelphia area to the Constructors' Barbecue.



After 4500 hours
of heat, dust, and heavy loads

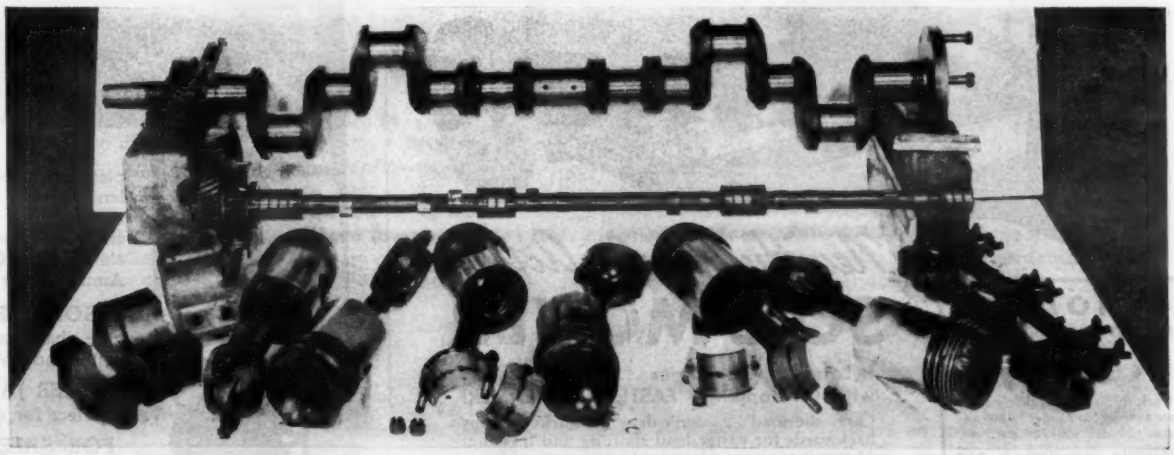
Engines look
like this

● These vital Diesel engine parts have put in 4500 hours of hard work on dusty, hot, and heavy earth-moving jobs. The parts are shown just as they came from the engine. They are entirely free from deposits that would interfere with satisfactory operation, although they have not been cleaned.

Here's visible evidence of superior lubrication by Stanolube HD Motor Oil! The benefits of this clean and protective lubrication have meant important savings for the Central Construction Company, Indianola, Iowa. Each of 32 Diesel units—used by this company for grading and earth moving—has been operated for nearly 4500 hours during two seasons of work. *No overhauls have been required.* There has been no downtime due to lubrication troubles.

Consider the Stanolube HD benefits obtained by the Central Construction Company in the light of your own fleet operations. Under severest conditions of service, this heavy-duty lubricant will keep your fleet engines clean, free from corrosion, and protected against wear. A Standard Oil Automotive Engineer will help you make the most effective use of Stanolube HD.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY (INDIANA) STANDARD

BACK-RIP SCARIFIER

RIPS in your dead-head time when backing for new load.

BACK-RIPPING Saves Contractors TIME, MONEY and EQUIPMENT.

Hinged teeth assemblies mount on back of Bulldozer moldboards.

SWINGS FREE WHEN DOZING

SMALL EQUIPMENT COMPANY
816 North La Cienega Blvd.
LOS ANGELES 46, CALIFORNIA

Distributor Doings

(*Continued from preceding page*)

and FlameZel tarps. A major event of the 6-hour barbecue was the world premiere of Lodover, a new 1-yard tractor shovel developed by Service Supply for the International TD-9 tractor.

An air-thrill show added spice to the noon-time entertainment—the barbecue was held at Old Star Airport in Langhorne, Pa.—and following the demonstrations, equipment operators went into action in a "Beat the Experts" contest.

Handles Concrete Vibrators in N. Y.

The Construction & Equipment Division of the Syracuse Supply Co., Syracuse, N. Y., has been appointed distributor for Stow Mfg. Co. in central New York State. It will handle the complete line of concrete vibrators, vibrator accessories, and screeds.

New Distributors for Heil

Two new distributors have been welcomed into The Heil Co. fold. Davis Wrecking Co., of Little Rock, Ark., will sell and service Heil bodies and hoists. And Myers Equipment Co., Duluth, Minn., is all set to go on Heil petroleum transport tanks and street flushers.

Cowger Named by Republic Rubber

The T. S. Cowger Co., of Helena, Mont., has been appointed an accredited distributor by Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio. It will carry a representative stock of Republic's mechanical rubber goods.

To Handle Hose Couplings in West

The East Pacific Co., 208 S. W. Stark St., Portland, Oreg., has been appointed manufacturer's representative for Hose Accessories Co., Philadelphia manufacturer of Le-Hi hose couplings. The company's territory includes Washington, Oregon, Idaho, western Montana, and British Columbia. R. B. Yettick owns and operates East Pacific.

Newton R. Crum, 1320 Santa Fe Ave., Los Angeles 21, Calif., is now Le-Hi representative in California, Arizona, and Nevada.

Beckwith Machinery Co. demonstrated its job-repair services for heavy earth-movers during the ground-breaking ceremonies for the western extension of the Pennsylvania Turnpike. Beckwith officials in the group photo are Sales Engineer Pletz (first on the left), General Sales Manager Cameron (fourth from left), and Sales Manager Stamy (extreme right). Next to Mr. Pletz at the left is Dwight W. Winkelman who has the contract for the first section of the extension.

Dealer Demonstrates Job Repairs During Turnpike Ground Breaking

Ground-breaking ceremonies for the western extension of the Pennsylvania Turnpike took place near Irvin, Pa., this past October. Highlight of the ceremonies was an earth-moving demonstration for the crowd, in which Beckwith Machinery Co., Caterpillar distributor in western Pennsylvania, showed the more than 10,000 onlookers how emergency parts are delivered to a job and how speedy service trucks handle repairs in the field.

Dwight W. Winkelman, of Syracuse, N. Y., has the contract for the first section of the extension. The completed road will stretch 327 miles from Philadelphia to the Ohio border, and is scheduled for completion sometime in 1951.

Roller Dealer in Northern Calif.

Edward R. Bacon Co. of San Francisco has been appointed exclusive distributor by Tampo Mfg. Co., of San Antonio, Texas. Its territory will be that part of California which lies north of and includes the counties of Monterey and Fresno. Bacon has branches in Sacramento, Fresno, Oakland, and Stockton.

New Dealers Represent Hyster

Three new dealers are now handling fork lift trucks, straddle trucks, mobile cranes, and their attachments made by the Hyster Co., of Portland, Oreg.

A. & W. Engineering Co., Miami, Fla., covers 17 counties in the southern part of that state. John W. Fulton is President and C. H. Scott is Vice President of the firm, which also sells small hoists, hand trucks, pallets, and other material-handling and maintenance equipment.

Wrenn Brothers of Charlotte, N. C., has all of South Carolina, the southern part of North Carolina, and most of Georgia. Owners J. Preston, Paul E. Wrenn, and George L. Wrenn have been in business since 1942. They have a branch office in Atlanta, Ga.

King & Kringel Machinery Corp. of Denver, Colo., represents Hyster in Colorado, most of Wyoming, and western Nebraska. K. T. King is President, J. R. Kringel is Secretary-Treasurer, and James G. Doyle is Vice President.

Road-Machine Dealer Central Ohio

Bauer Industrial Sales, Inc., of Worthington, Ohio, is now handling the complete line of Huber road machines —including the maintainer, heavy-duty graders, and tandem and 3-wheel rollers—in central Ohio. President of the firm is Irving R. Bauer; Raymond E. Davis is Vice President and Treasurer.

New Equipment House in Houston

J. W. Chumley has opened his own contractors' equipment firm called Chumley Machinery Co., Ardmore at Dixie Drive, in Houston, Texas. Mr. Chumley has been in the machinery

(*Concluded on next page*)

LEVELS and FILLS at LESS COST

New Hydraulic Action

SOIL MOVER

It Loads . . . It Carries . . . It Dumps . . . without Stopping! FASTER . . . EASIER!

Carry the load . . . don't drag it. Bucket dumps backwards for easier load spotting and leveling. Makes it easier to fill those hard-to-get-at places.

4-MODELS!

MODELS WR 100 & 200 — Wheels behind and inside frame for close work to buildings, ditches and excavating. Model 100-54" cut. Model 200-72" cut.

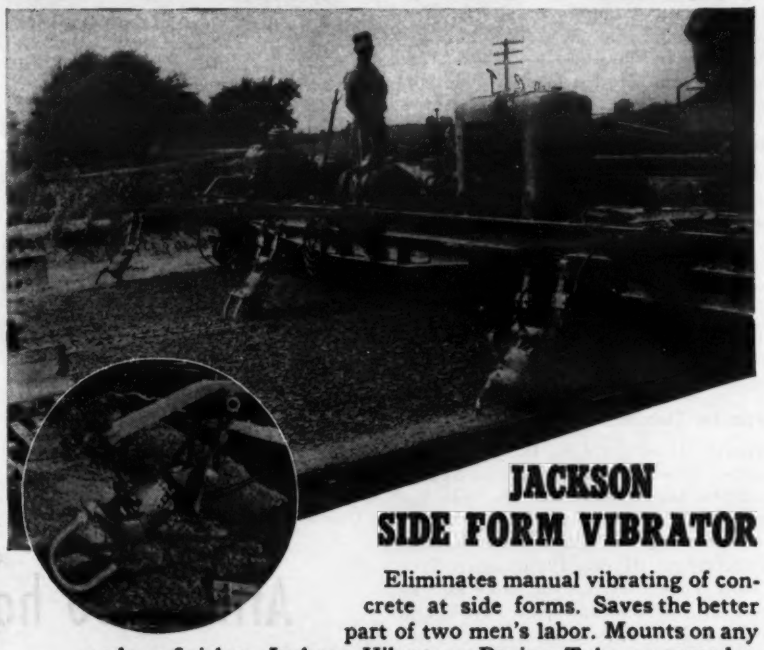
MODELS WS 100 & 200 — Wheels on side of bucket. Wide variety of uses. Ideal for filling in foundations. Model 100-54" cut. Model 200-72" cut.

Write for FREE descriptive literature TODAY! Write:

THE SOIL MOVER CO.

Dept. CE-2 COLUMBUS, NEBRASKA

STEP UP YOUR PAVING PROFITS!



JACKSON SIDE FORM VIBRATOR

Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or spreader. Employs two or more vibratory units that are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement without fouling — ride over any obstruction encountered. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher or spreader — no spots missed. Long-wearing, trouble-free.*

JACKSON VIBRATORY PAVING TUBE

Quickly makes plastic the stiff, drier concrete mixes which effect up to 10% cement savings. Concrete at forms or joints is, under most conditions, puddled perfectly, thus saving manual vibrating. Reduces spreading cost, steps up finisher progress. Complete compaction, the full width of the slab, and excellent finish is obtained. Perfectly adaptable to slabs 6" to 24" thick and for regular single or two-course construction. Easily adjustable in the field from 10' to 25' slab-widths. Quickly attachable to any standard finisher. Ample power to offset fast drying and setting conditions.*

JACKSON PORTABLE POWER PLANTS generate both single phase and 3-phase 115 volt, 60 cycle AC. Ideal for lights and power tools. Capacities: 1.25 to 5 KVA.

OTHER JACKSON VIBRATORY EQUIPMENT — perfect for every type of concrete placement.

FOR SALE or RENT at your Jackson distributor.* Get your FREE copy of the Jackson "Pocket Guide" showing complete line.

MANUFACTURED BY ELECTRIC TAMPER & EQUIPMENT CO. FOR

JACKSON VIBRATORS, INC., Ludington, Mich.

Distributor Doings

(*Continued from preceding page*)

business during all of his business career, except for several years in World War II. Lines handled include Osgood draglines and shovels, Rosco asphalt equipment and distributors, Barnes pumps, Sasgen derricks, winches, and hoists, and Cleveland Formgraders. Chumley also maintains a complete repair service.

West-Coast Dealers for J. D. Adams

Two recent distributorship appointments in northern California have been announced by the J. D. Adams Mfg. Co., Indianapolis, Ind. Tony Gosselin, Eureka, will handle Adams equipment in Humboldt and Del Norte Counties, and Orton's Equipment Co., Stratford, will serve Kings County.

Porter-Cable Purchases Sterling Electric Tool

The Porter-Cable Machine Co., of Syracuse, N.Y., manufacturer of Speedmatic and Guild portable electric tools, has purchased the manufacturing rights and facilities of the Sterling Electric Tool Products Co., Chicago, Ill. It will move the Sterling tools to Syracuse and there resume manufacture of Sterling portable electric and pneumatic sanders. (This is Porter-Cable's second such move within a year. Late in 1948 it purchased the Unit Electric Tool Co. of Syracuse, manufacturer of woodworking equipment.)

John A. Proven will direct the distribution of the products of these two companies, as well as the distribution of Porter-Cable's national lines, in his new position as Vice President in Charge of Sales. Mr. Proven's appointment to this position follows a year with the firm as General Sales Manager. Prior to his association with Porter-Cable, he was Vice President and Sales Manager of Sterling Tool Products Co.

Several other members of the Sterling staff have joined Porter-Cable. John R. Perkins has become a field representative; Earl C. Wheless and Norbert B. Leydorf are sales representatives in San Francisco, Calif., and Richmond, W. Va., respectively. Jerome J. Howe and Howard Smith are working out of Houston and Philadelphia, respectively; and Neil S. Rowe has also joined Porter-Cable as a sales representative.

Catalog on Fluid Drives

A new 28-page catalog and engineering data book, No. 2385, featuring fluid drives, has been released by Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill. The book covers types, sizes, arrangements, and dimensions of units available; features of construction; selection tables; typical examples of fluid-drive selections; and photographs of actual installations.

This catalog is, in effect, a progress report on the Link-Belt Electrofluid Drive, Type ED, a packaged power-transmission unit designed for cushioned starting of machines, smooth running under varying conditions of loading, and automatic overload protection.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 62.

Heads Lubricant Sales

A new Sales Manager has been named by D-A Lubricant Co., Inc., Indianapolis producer of heavy-duty lubricants and engine oils. He is Robert J. Binford, Jr., who has been with the company since 1939, except for the war years, and was formerly a sales supervisor working out of the factory.

The H. W. Moore Equipment Co., Denver distributor of International Industrial power equipment, is represented on this highway maintenance job near the summit of Pikes Peak. Sales Manager Walter Babcock—he's the one with his hat pushed back and his foot resting on the dozer—has just cracked a joke to Don Lawrie, Superintendent of the Pikes Peak Highway, and C. P. Fitzpatrick, Foreman. The TD-18 tractor with its Bucyrus-Erie 10-foot bulldozer is handling gravel stockpiled for the maintenance of the top 2½ miles of the famous 20-mile highway that twists and turns up the peak.

Electrode Carrier

A new Rod-Hod electrode carrier designed to save time and protect electrodes is now made by the Marquette Mfg. Co., Inc., 307 E. Hennepin Ave., Minneapolis 14, Minn. The Rod-Hod carries a supply of over 30 pounds of electrodes, and each rod may be quickly identified. The carrier saves wear and tear on pockets; saves time lost running back and forth hunting for welding rods. The Rod-Hod may be refilled with 5 and 10-pound Marquette Rod-Paks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 149.

Manages Trailer Sales

James M. Arroyo is the new Sales Manager of the Martin Machine Co., of Kewanee, Ill., manufacturer of goose-neck trailers for the heavy-construction industry. Previous to his appointment he headed export sales.

FEDERAL

NOW OFFERS YOU...

34 POWERFUL DIESELS

A SURE SOLUTION TO YOUR HEAVY HAULING PROBLEMS

Here's a sure way to keep ahead of your costs . . . switch to powerful, heavy-duty Federal Diesel Trucks now. You'll get peak operating economy . . . fuel savings up to 50 per cent . . . greater power . . . bigger payloads. These statements are backed by every time-proven feature that makes for maximum truck operating efficiency . . . plus years of experience and "know how" in the building of powerful trucks for heavy-duty service.

Federal's broad range of Diesels will match your toughest on-or-off the road hauling job. They are designed to do the job better, at less cost per mile. Get all of the facts from your Federal dealer. They will convince you that Federal Diesels are today's outstanding truck value.

Federals Have Won . . . By costing less to run

Look TO FEDERAL FOR BETTER SERVICE
OVER 425 TRUCK COMBINATIONS
from ¾ to 35 tons including six-wheelers
GASOLINE or DIESEL

TEAR OFF THIS COUPON AND MAIL TODAY!
Federal Motor Truck Company
Dept. No. C-8, Detroit, Michigan, U.S.A.
I'm interested in having complete information about Federal Diesel Trucks.
Name .....
Company .....
Address .....
City ..... State .....

FEDERAL TRUCKS
FEDERAL MOTOR TRUCK CO.
DETROIT 9, MICHIGAN, U.S.A.

Rubber Springs Used On New Tractor Seat

Rubber springs to take the jerks and bumps out of riding a tractor have been developed by the United States Rubber Co., Rockefeller Center, New York 20, N. Y. They operate on a torsional shear principle, the company said, and consist of a thick layer of especially compounded rubber sandwiched between two metal plates; the rubber is fastened to the metal by a special brass-plating process. The springs are mounted in pairs on a new tractor seat now being produced by the Bostrom Mfg. Co., of Milwaukee, Wis.

As the tractor rides over rough ground, the rubber twists and turns with each bump and jolt, cushioning the initial shock and leveling out the usual sharp rebound. This cushioning effect is designed to give the operator a "floating" ride which lessens body fatigue and helps prevent internal injury from heavy shocks. The springs can be adjusted for various weights.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 9.

Wellpoint-System Booklet

A 64-page booklet describing the Moretrench wellpoint system for dewatering, stabilizing, and preventing mass movement of wet soil during excavation has recently been offered by Moretrench Corp., 140 Cedar St., New York 6, N. Y. The booklet describes, and illustrates with job-site photographs, over forty installations of Moretrench wellpoints. The problems and the solution for each application are briefly analyzed.

Moretrench equipment cataloged in the booklet includes wellpoints, pumps, parts, and fittings. Features and specifications of the equipment and the system are given. Graphs indicate the characteristics, brake horsepower, and efficiency of each of the pumps at any particular total dynamic head or capacity. The pumps range from the 6-inch 1,200-rpm model with a capacity of 1,750 gpm, to the latest addition to the Moretrench line, the new 12-inch 1,600-rpm pump with a capacity of 4,400 gpm.

This literature on the Moretrench wellpoint system may be obtained from the company, or by using the Request Card at page 16. Circle No. 54.

This is the new Miller Model B tilt-top trailer. It has a 10-ton capacity.

Tilt-Top Trailers

A new model of heavy-duty tilt-top trailer is now manufactured by Ray Miller Research Engineers, 727 W. Burnham St., Milwaukee 4, Wis. The frame of the 10-ton Model B is formed of channels 12 inches deep in the center and of ¼-inch steel with 5 cross-members. Three-inch channels extend from corner to corner in the form of an X. The X-member, which supports the platform, is welded to each cross-member, bracing it for side shock loads. The tongue, front, and rear cross-members are 6-inch rolled channels. The axle is 16 inches deep and is built of 4-inch tubing, a 4-inch I-beam, and a 10-inch channel. Dual wheels are 10-ton approved Budd wheels; tire size is 8:25-15, ply. An 8 x 14 foot x 2-inch oak planking, with 2 x 3-inch side angles, is supported by the X-member in the frame and is also braced from the side angles to the main frame for overhanging loads. Approved 10-ton Timken bearings are standard equipment. The two-speed winch, 24 to 1 and 84 to 1 ratios, is welded securely to the frame and is optional, as are the 2-way hydraulic tilt control, electric brakes, parking stand, and lighting.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 86.

Crum Represents Flexco

Newton R. Crum is the new representative in California for Flexible Steel Lacing Co., Chicago manufacturer of Alligator and Flexco belt fasteners for conveyor and transmission belts. For the past four years he was owner of the Western Industrial Supply Co. in Sacramento.

New Holland Promotes Two

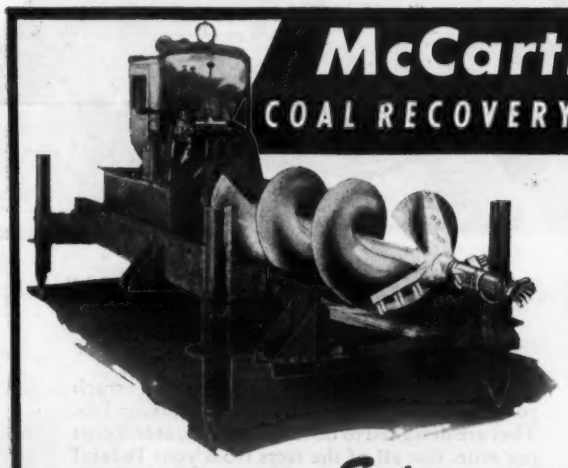
Norman H. Kessler, former Chief Sales Engineer, has been named Chief Engineer of the New Holland Mfg. Co., Mountville, Pa. James D. Pfahl, a member of the sales staff, has been made Assistant to the Sales Manager.

Pfahl joined New Holland in 1947 as a sales correspondent. Kessler, before he came with the company in 1946, had helped his father, Lee H. Kessler, develop the dual impact action which New Holland now builds into its double-impeller breakers. As an engineer with the firm, he played a major part in developing the Models 1212, 2020, 3030, 4040, and 5050 breakers.

Chain Belt Appointments

Russell G. Davis is a newly appointed sales executive of the Chain Belt Co. of Milwaukee, Wis., and Robert R. Horton has been named Midwest Sales Representative for the Construction Machinery Division of the company.

McCarthy
COAL RECOVERY DRILL



Heavy
Rugged
Powerful

...GIVES YOU LARGE *Extra* STRIPPING PROFITS

Don't let high overburden costs choke off your profits! Let McCarthy Coal Recovery Drills side-step your problem for you. This machine is specifically built for recovering coal after further strip mining is unprofitable. It bites right into the heart of the seam, pulling out a continuous stream of clean coal all ready for loading. With each McCarthy, you get 60 to 150 tons of coal every eight hours. The total cost, including depreciation on equipment, is less than $1.50 per ton mined, and you can profitably extract 50 to 70 percent more coal than was previously possible. See your McCarthy dealer today or write us direct for information.

THE SALEM TOOL COMPANY
769 SOUTH ELLSWORTH AVE., SALEM, OHIO, U. S. A.

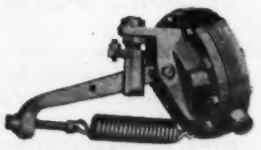
50 YEARS OF DEPENDABLE SERVICE 1900-1950

Model 105 Unistage compressor with tool boxes large enough to carry complete assortment of tools. Delivers 105 cubic feet actual air per minute. Other portable models from 20 to 420 cubic feet.

You'll do this... *half as often* with a

SCHRAMM *Unistage*

Portable Air Compressor



SCHRAMM'S Exclusive new *Pneumastat*

You get this saving with the Pneumastat equipped Schramm Unistage compressors. You will approve the simplified construction of the Schramm Unistage models equipped with their exclusive Pneumastat control because . . . you get higher working pressures . . . more work from your tools. No continuous loading and unloading. Even flow of air no matter how variable the need. Saves motor and compressor wear and tear; fuel savings up to 50%.

Some of the other features you will want to know about include: positive cam operated air intake valves that deliver more air per horsepower, new super efficiency compressor design, eliminating two staging and intercoolers, water cooled throughout, dual fan belts, etc. For full details write for copy of Bulletin 4915.

SCHRAMM'S complete line of Construction Tools, include:
Rock Drills — Wagon Drills
Paving Breakers — Clay Spades
Trench Diggers — Backfill Tampers
Tie Tampers — Chain Saws
Air Hose and all accessories

SCHRAMM INC.
THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

Road Widened; Paved With Hot Plant-Mix

All Aggregate Is Crushed at Quarry Near Asphalt Plant Set Up for 28-Mile Highway Contract in Tennessee

By WILLIAM H. QUIRK,
Eastern Editor

(*Photo on page 1*)

✦ ONE of last season's longest highway improvement contracts in Tennessee was completed over a 28-mile stretch of U. S. 64 from Waynesboro in Wayne County on the west, to Lawrenceburg in Lawrence County on the east. This location is in the south-central part of the state. The project included widening an old 18-foot bituminous surface-treated pavement 2 feet on each side, and laying two courses of hot plant-mix on the widened 22-foot highway.

The job got under way in July, 1948, after the Tennessee Department of Highways and Public Works awarded a contract to the Southern Quarries & Contracting Co. of Columbus, Ohio, on its low bid of $596,173.24. Fall rains slowed the work, and finally shut down operations in December. Spring rains in early 1949 delayed the resumption of activities until April 5. After that, however, progress was consistently steady. The black-top construction was scheduled for completion in July, and the shoulder work shortly after that.

All aggregate, both for the macadam widening and the plant-mix, was taken from a limestone quarry located 2 miles south of U. S. 64 and 8 miles west of the east end of the project. The stone was quarried and crushed for the Southern Quarries & Contracting Co. by the Waters Construction Co. of Elizabethtown, Ky. The main contractor hauled the aggregate from the crushing plant to the asphalt plant that he set up along U. S. 64, a distance of 1.7 miles from the crusher. The hot-mix plant was also 8 miles from the east end of the job.

Limestone Quarry

Limestone rock for the project was taken from two quarries, one on each side of the crushing plant. The larger quarry had a face 150 feet long and averaged 60 feet high. The latter dimension was increased to 72 feet in the closing weeks of the contract. In the smaller quarry the face was only about 18 feet high and 75 feet long. Each quarry had a Lorain ¾-yard shovel, an Ingersoll-Rand wagon drill, and a Gardner-Denver 365-cfm compressor to furnish the compressed air. From 10 to 12 feet of overburden was first stripped off the ground by the shovels before drilling operations got under way.

Drill holes averaged 6-foot centers both ways. The wagon drills used 1¼-inch round drill steel in 6, 12, 18, 24, and 30-foot lengths. Timken bits, from 2¼ down to 1⅞ inches averaged 6 feet of drilling before being replaced. The holes were charged with Atlas 60 per cent dynamite, and the yield averaged 2 tons of rock to one pound of powder. In the larger quarry the shovel loaded the rock into a Koehring Dumptor that averaged 6 yards a load. Two Ford 4-yard trucks worked the smaller quarry. From each quarry the haul was 300 feet to the crushing plant.

Stone Crushing Plant

A Cedarapids crushing plant produced all the aggregate. The quarry rock was dumped into a receiving hopper equipped with a 12-foot feeder that moved the material along to a 20 x 36 primary jaw crusher. The feeder and primary crusher were driven by a Caterpillar 8800 diesel engine. From this first unit the stone advanced 22 feet over a belt to a 4 x 6-foot scalping screen with a 2-inch mesh. Material not passing the screen dropped into a 10 x 36 jaw crusher powered by a Caterpillar 318 diesel. From this second unit

(*Continued on next page*)

C. & E. M. Photo
This Cedarapids crushing plant produced all the aggregate for the Tennessee road improvement contract. This view shows the roll crusher and, at extreme left, the D-17000-Caterpillar diesel that ran it.

QUICK LOADING . . .
You'll get big loads in short travel distance with the exclusive Bucyrus-Erie double-curve cutting edge. The blade's design "boils" the dirt up and keeps it on the move — distributing the load uniformly. You load more pounds of dirt per cubic yard!

FAST HAULING . . .
Rolling resistance is low because tires are of ample size to provide maximum, equalized flotation — a feature which helps the Bucyrus-Erie stay on top in soft going! Front and rear tires same size — interchangeable — meets Tire and Rim Association specifications.

SWIFT DUMPING . . .
Positive rolling action ejects dirt with greater speed. Dirt rolls back off the apron and forward from the bowl smoothly. There is no sliding forward of a dead load . . . no corners, no projections, no sidewalls to catch dirt.

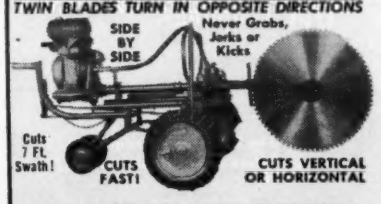
RAPID TURNING . . .
A streamlined goose-neck permits a short turning radius . . . low fairlead sheaves eliminate tipping with winch lines when turning . . . a low center of gravity gives exceptional stability — these features add up to short, *fast turns*.

CAPACITIES: From 4 to 10 cubic yards.
Also available are B-type (front lift) scrapers, 17 and 22 cubic yards.

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN
166T40C

See Your INTERNATIONAL Industrial Tractor Distributor

JACOBS SAFETY WONDER SAW
WORLD'S GREATEST SAW INVENTION
TWIN BLADES TURN IN OPPOSITE DIRECTIONS



FOR RIGHT-OF-WAY CLEARING
The greatest brush and timber clearing saw invention in America. No other saw ever built can equal its operating advantages and features. Self-propelled. Hydraulic oil transmission drive. Saw in horizontal position swings to cut 7 ft. swath.

WRITE FOR FREE FOLDER!
JACOBS WIND ELECTRIC CO., INC. Industrial Division Minneapolis 11, Minn.

Road Widened; Paved With Hot Plant-Mix

(*Continued from preceding page*)

the stone was conveyed by a short belt to a 4 x 12-foot screen, also with 2-inch openings. Any stone still retained fell into a 24 x 40 roll crusher operated by a Caterpillar D17000 diesel engine.

From this third crusher the broken stone was lifted on a 30-inch belt, 75 feet long, to a double-deck sizing screen, 1½ inches on top and ⅝ inch on bottom. Oversize material retained on the 1½-inch screen slid down a chute into a 3XP 30 x 30 pulverizer driven by a Caterpillar D13000 diesel. This fourth crushing unit broke down the remaining large stone into sizes passing a 1½-inch screen. The product resulting moved up a 65-foot conveyor to the scalping screen at the second crusher, and from there along another conveyor that discharged onto the 75-foot conveyor leading to the double-deck sizing screen.

By changing the mesh in these screens, various sizes of stone were obtained. However, for the asphaltic concrete all the stone was graded from 1½ inches down for both binder and top courses. Beneath the sizing screens was a three-compartment bin. In the normal operations for paving material only two of these 15-ton compartments were used. One contained stone graded from 1½ inches down to ⅝ inch; while the other held everything below ⅝ inch. The average production at the plant ranged from 100 to 125 tons per hour. The crushed stone was hauled 1.7 miles to the asphalt plant in six dump trucks holding 6 tons each. The weights were checked on a Winslow beam scale, then the material was dumped into two stockpiles, one for the fine and the other for the coarse aggregate.

C. & E. M. Photo

Barber-Greene Finishers lay a top course of hot-mix on U. S. 64 in Tennessee.

Widening Operations

In widening the old, badly cracked 18-foot bituminous pavement, the contractor cut out a trench 2 feet wide x 8 inches deep along each side. This was done with a drop blade on a Galion 102 motor grader. The trench was then filled with two 4-inch courses of No. 8 stone which was also processed at the quarry. The No. 8 size is graded from 2½ inches down to ¾ inch. Each course was choked with a ¾-inch layer of ⅜-inch screenings. An Apsco spreader laid the No. 8 stone which was then given a shot of AC-8 asphalt, penetration 85-100, at the rate of 0.75 gallon to the square yard. The choke stone was added and rolled in by an Apsco trench roller. This operation was repeated for the second lift which brought the widening strips up level with the surface of the original pavement. Widening started at the west end of the project and continued to the eastern terminus, which is about 1½ miles west of Lawrenceburg.

Asphalt Plant

The asphaltic concrete for the 28-mile paving project was mixed in a Hetherington & Berner 2-ton pugmill asphalt plant. AC-8 asphalt used in the penetration widening was also employed in the mix. Half the bitumen was supplied by the Standard Oil Co. of Louisiana, Baton Rouge, and was shipped in tank cars to a siding of the Louisville & Nashville Railroad at Lawrenceburg. The remaining half came from the Lion Oil Co. at Eldorado, Ark. At the siding the bitumen was unloaded from the car by a Cleaver-Brooks pump and heater, and stored in a 10,000-gallon tank. A similar-size tank held fuel oil which was supplied by the Hunt Oil Co. of Tuscaloosa, Ala.

From the siding in town the asphalt was hauled 10 miles to the plant in a Littleford 2,600-gallon GMC-mounted transport truck. At the plant a Viking 3-inch pump driven by a Le Roi gas engine transferred the bitumen from the truck to a 10,000-gallon storage tank. Fuel oil was stored in an 1,800-gallon tank at the plant. Steam for heating the asphalt tank and for other plant operations was supplied by a Leffel horizontal 40-hp boiler heated by a single oil-burning Hauck torch. From the plant tank, the asphalt was pumped to the mixing tower and weigh bucket by another Viking 3-inch pump which was driven by a 10-hp electric motor. When the flow of bitumen was not required at the plant, a by-pass valve sent it back to the storage tank.

Aggregate Handling

From the fine and coarse-aggregate stockpiles, the crushed stone was fed into a 20-ton 3-compartment receiving hopper by a Marion crane equipped with a 40-foot boom and a 1¼-yard clamshell bucket. The hopper was located between the two piles which were kept to neat lines by an International TD-14 tractor dozer. When binder course was being mixed, one compartment of the hopper was loaded with fine aggregate, the second compartment with coarse aggregate, and the third with a blend of the two. The blend was achieved by taking a bucket alternately from each stockpile. For the top course all three compartments were filled with the smaller size of stone.

At the bottom of the hopper was a feeder with a reduction gear and rheostat for fast or slow operation. The stone was advanced to the bottom of a 20-foot cold elevator which unloaded into a 25 x 5-foot-diameter drier heated by two Hauck burners at the discharge

(*Concluded on next page*)

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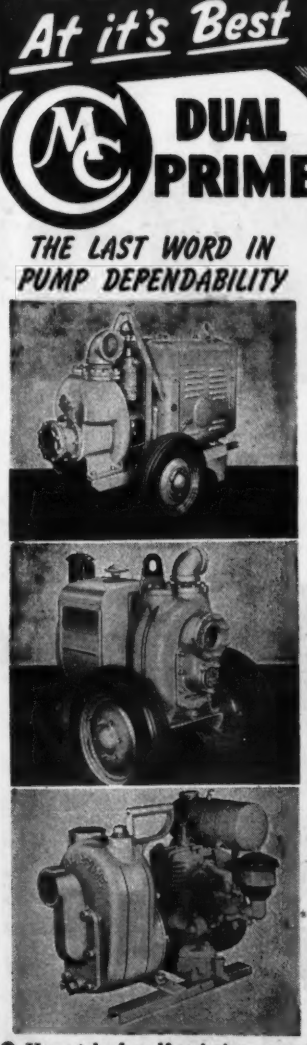

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● CMC DUAL-PRIME pumps give top performance and maximum dependability even under the most adverse conditions.

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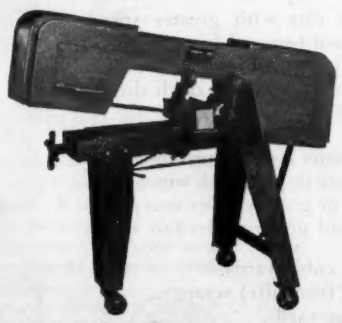
It's Portable...

The "Junior" Model B Johnson Band Saw comes either with or without casters. Using casters, it can be easily pushed from one section of the shop to another, or two men can carry it. It has three-point supported rigidity—accuracy and speed. It will reduce your metal cut-off work. Capacity: 5" rounds, 10" flats.



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is also furnished in the larger Model J; Capacity 10" rounds, 18" flats. Sturdy and fast. Cuts square and true.

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ALBION, MICHIGAN

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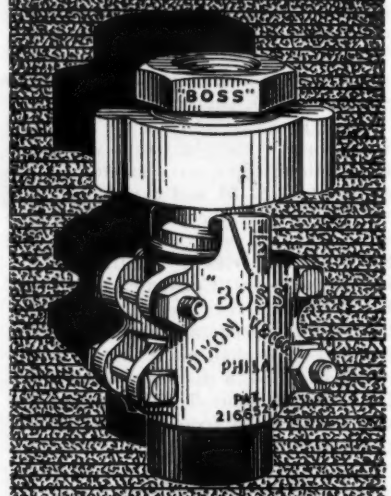

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Washer type female coupling
Style W-16

Users of this long-time leader in the Dixon line represent a roster of American industry. Its quality and design distinguish it from others frequently yet improperly classified as "Boss type couplings."

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end. Fumes and fines were drawn out of the drier through a top center opening by a 42-inch-diameter fan. The material passed into a dust collector where the fines were piped down to the foot of the hot elevator. Fumes and smoke were discharged out a 40-foot smokestack. In the drier the stone was heated up to 350 degrees F then chuted to the bottom of a 40-foot hot elevator.

From the hot elevator the stone was spilled out over a gradation unit—a 4 x 6-foot double-deck screen with the upper deck divided into 2-inch and 1½-inch mesh, and the lower deck divided into ¾-inch and ¼-inch mesh. The resultant sizes were collected in four bins, each holding about 4 cubic yards. The batches were weighed out in a weigh bucket on Howe dial scales and then admitted to the 2-ton pugmill to which the asphalt was added. At this point the temperature of the bitumen ranged from 250 to 270 degrees F. After a 45-second mixing period the hot-mix was discharged into the waiting trucks below.

Plant Operation

The pugmill was operated by a General Motors 130-hp diesel engine. All the other plant functions were handled by direct-current electric motors, the power being supplied by a 150-hp GM diesel generator set. This unit drove eleven motors of the following size and purpose:

Drier	100 hp
Exhaust fan	40 hp
Asphalt pump	10 hp
Hot elevator	10 hp
Gradation screen	10 hp
Diesel generator fans	10 hp
Aggregate feeder	5 hp
Water pump	5 hp
Fuel pumps (two)	½ hp
Asphalt feeder	¼ hp

The plant has a maximum capacity of 110 tons per hour. On this job the average daily production for a 10-hour run was 900 tons. Water for plant use was supplied by a deep well located on the site. Plant equipment also included a Barber-Greene loader.

The Mix

The mix for both binder and top courses included 4,000 pounds of stone per batch, to which the bitumen was added. Typical batch weights for both courses were as follows:

	Binder	Top
Asphalt AC-8	200 lbs.	243 lbs.
Stone (1½ to ¾-inch)	1,200 lbs.	....
Stone (¾ to ¼)	1,200 lbs.	1,600 lbs.
Stone (¾ down)	1,600 lbs.	2,400 lbs.
Total	4,200 lbs.	4,243 lbs.

Laying the Black-Top

In preparation for the paving, the road was swept with a Hough power broom pulled by a truck. A light tack or fog coat of asphalt emulsion was then applied at the rate of 0.01 gallon to the square yard by an Etnyre 1,200-gallon distributor mounted on a GMC truck. This was done full width, for during the paving operations the highway was closed to through traffic. Motorists took a 63-mile detour to the north in order to cover the 28-mile distance between Waynesboro and Lawrenceburg.

The hot-mix was hauled from the plant by Anderson & Turner of Huntington, Tenn. This hauling contractor used an average of eight trucks (18 on the long hauls), each holding four batches. The maximum haul, from the plant to the west end of the project, was 20 miles. Material was laid at a temperature averaging around 300 degrees F by two Barber-Greene Finishers working together, each handling an 11-foot lane. When working on the binder course they kept usually within 50 feet of each other. On the top course this distance lengthened to 75 to 100 feet. In either case a hot center joint was always assured.

Binder was laid at the rate of 250 pounds to the square yard, or to a 2½-inch thickness. The top course averaged 125 pounds to the square yard, and varied in thickness from 1 inch to 1¼ inches. Behind each finisher the mix was compacted by a Galion 8-ton tandem roller. Production in terms of pavement laid averaged from 3,000 to 3,500 linear feet of binder, full 22-foot width, for a 10-hour day. The top course, also full width, averaged 6,500 linear feet per day. Like the widening, the paving also progressed from west to east.

Quantities and Personnel

The major items in the 28-mile widening and paving contract included:

Crushed stone for widening	22,064 tons
AC-8 asphalt, macadam widening	336,875 gals.
Screenings, macadam widening	1,508 tons
Binder aggregate	47,079 tons
AC-8 asphalt for binder course	572,500 gals.
Top-course aggregate	21,958 tons
AC-8 asphalt for top course	323,859 gals.
Tack coat, asphalt emulsion	9,000 gals.

The Southern Quarries & Contracting Co. of Columbus, Ohio, employed an average force of 50 on the contract under the direction of George E. Hull, Superintendent. Ray Martin was Foreman at the asphalt plant. V. K. Gamble is General Manager of the company.

H. L. Waters supervised the quarrying and stone-crushing operations of the Waters Construction Co.

For the Tennessee Department of Highways and Public Works E. M. Bryan was Resident Engineer with Jack Day Inspector at the asphalt plant and John Grigsby Inspector on the laying of the pavement. The project is located in Division 3 which is headed by R. J. Love, Division Engineer with headquarters at Nashville.

E. W. Eggleston is Commissioner and Sam Squires is State Highway Engineer, with O. F. Goetz State Construction Engineer.

Broadside on Matched Equipment for Tractors

A broadside on the full line of Isaacson matched equipment for International tractors is available from the Isaacson Iron Works, 2917 E. Marginal Way, Seattle 14, Wash. Illustrations and descriptions are given for bulldozer blades, scrapers, rooters, rollers, brush cutters, winch hoists, brush rakes, cable power units, and snow plows for use with International tractors.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 48.

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how little it costs you to equip a CHRYSLER INDUSTRIAL ENGINE with . . .
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Fluid Drive!
Does operation of your equipment require frequent clutching and de-clutching?
Is your equipment subjected to damaging shock loads? Is it desirable to speed up your engine close to torque peak with the output shaft turning at a lower speed?
Do shock loads sometimes stall your engine or cause failure of drive train parts? Would gradual oil-smooth acceleration improve your operation?
If your answer is "yes" to any of these questions, better investigate Chrysler Industrial Engines now! With gyrol Fluid Coupling, Chrysler Industrial Engines bring scores of new advantages to the operation of power equipment.
Chrysler's famous gyrol Fluid Coupling has been proved on more than a million Chrysler, DeSoto, and Dodge passenger cars and trucks over a period of 11 years. Proved on scores of industrial applications.
Its cost is amazingly low! Actually only a few dollars more than the cost of the conventional flywheel which it replaces! For more information, see your nearest Chrysler Industrial Engine Dealer, write us, or mail the coupon today!
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Send us full information on Chrysler Industrial Engines with gyrol Fluid Coupling for use on _____ equipment.
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Breaker and Tamper Demonstration Tour

A 40-state demonstration tour of the Mighty Midget pavement breaker and tamper was the R. P. B. Corp.'s solution to inquiries from prospective customers. Many times during the year, requests were received by the company for a demonstration of its equipment. Many of these requests were from small-town utility companies and rural contractors, who would find it a great inconvenience to travel several hundred miles to witness an on-the-job demonstration. So with that old parable about Mohammed and the mountain in mind, a crew of engineers from R. P. B. loaded their Mighty Midget on board a truck and took off.

These engineers, with an advance schedule and good timing, have up to the present time demonstrated the unit in operation on pavement breaking and backfill tamping to over sixty prospective purchasers. When the trip is over they will have covered 40 states. Often arrangements are made for doing the work right on a particular job in the visited community. Increased sales have been reported by dealers as a result of the tour, the company says.

Further information on the tour or about the equipment may be secured from the company at 2751 E. 11th St., Los Angeles, Calif. Or use the Request Card at page 16. Circle No. 120.

New Steam Cleaner

An electric ignition is featured in the new automatic steam-cleaning unit manufactured by D. C. Cooper Co., 1467 S. Michigan Ave., Chicago 5, Ill. The machine burns fuel oil or kerosene and is said to provide 100-pound steam pressure for cutting grease from motors, floors, walls, racks, and equipment.

The unit contains a chamber for 15 pounds of cleaning compound, which goes to the heating coils without passing through the pump, to avoid clogging. No pre-mixing of compound is required. The strength of the cleaning solution may be adjusted through a metering valve located on a panel board. One filling of the compound chamber provides over 8 hours of continuous operation, according to the manufacturer.

The water pump operates from any standard water supply or will draw water from any source. The unit provides a hot-water rinse of up to 360 gallons per hour, Cooper says. Sectional heating coils may be removed and the machine will, the company says, operate with one or two coils removed. Only three valves are required for full operation.

The cleaner's ½-hp sealed ball-bearing motor requires no lubrication. Standard equipemnt includes 25 feet of oil-resistant steam hose and a balanced steam gun. The cabinet may be removed for maintenance or inspection of the sub-assembly containing all operating parts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 61.

Tractor-Compressor Unit

Literature on the Le Roi 105 Tractair, a tractor and compressor combination, is available from the Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis. Specifications are given for the tractor, compressor, engine, and tool capacity of the unit. All design and construction features are also included. The literature covers all of the attachments and their applications for use with the Tractair: a front-end loader, utility boom, backfill blade, reversible snow plow, V-type snow plow, rotary sweeper and Tulsa winch.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 111.

To answer inquiries from prospective customers, R. P. B. engineers loaded a Mighty Midget pavement breaker on this truck and took off for a 40-state field demonstration.

Three Platform Trailers

A 4-page folder presenting three platform trailers with capacities of 3, 6, and 9 tons has been issued by The Trailmobile Co., 31st and Robertson Aves., Oakley, Cincinnati 9, Ohio. The catalog illustrates details of the improved construction of the Trailmobile platform trailer. It points out that the main rails of the frame are 15 inches deep and that the cross-members and outriggers are spaced every 18 inches along the full length of the trailer. The cantilevered outriggers are tongued integrally to the frame in order to divert all load stresses into the main rails.

Photographs and diagrams illustrate the construction features of the Trailmobile trailers. Designated as Models W1-36, W1-66, and W1-86, these trailers have maximum pay loads of 15,000, 23,600, and 28,000 pounds respectively. Complete specifications are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 74.

SPECIAL trade-in offer

to owners of 15* year and older Mack trucks

The time has come when it will pay you to pension-off your "Old Faithful" and modernize your hauling with a new Mack truck. *Sure there's years more work left in your Mack.* That's proved by the thousands of Macks on the road well over 15 years old. As an old friend, we want you to get the benefits of a modern Mack. We want you to get the advantage of Mack's special trade-in allowance offer.

Why it will pay you to modernize NOW with Mack

1. *You may never again be able to trade in your 15 year or older Mack* at so good a price—for the simple reason that your dollars today will buy more than they ever did before.

2. *New Macks have the built-in stamina and endurance* that has made Mack famous—PLUS tested, new features that insure still lower hauling costs.

3. *Remember, when truck-price is the battleground of purchase . . .* proved quality, proved dependability, proved longest life, PROVED MOST TON-MILES PER DOLLAR, are the only yardsticks by which you can truly measure the purchasing power of your truck money.

So get in touch with your nearest Mack branch or dealer today. Ask for the trade-in price on your old Mack.

* At the last official count of R. L. Polk, there were 12,970 MACK TRUCKS 15 years and older still in operation.

Modernize with Mack "Built Like A Mack —To Outlast Them All"

Mack Trucks, Inc., Empire State Bldg., New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Dam Manager Says Radio Network O.K.

"Don't Know How We Ever Got Along Without It," Says General Superintendent At Medicine Creek Dam

✦ HIGH on the left abutment of Medicine Creek Dam near Cambridge, Nebr., a grim-faced construction superintendent stood by his automobile. A radio transmitter was in his hand. Far below, spread out before his eyes, 37,000 second-feet of raging floodwater ripped and tore at the slender cofferdam which protected the fill and spillway.

Men and equipment worked like ants. Extra dirt and rock was coming in fast. The crews were trying to build the cofferdam thicker and thicker. Bulldozers wormed their way around. Medicine Creek lashed again and again in fury.

Suddenly the man on the hill—General Superintendent George M. Stiers of C. F. Lytle Co. and Amis Construction Co.—spotted a place where the river was catching up to the top of the levee. Speaking into his transmitter, he talked to Excavation Superintendent Harold Cross as easily as if he were at his side.

"Get your bulldozer about 500 feet west, and dump a few loads in that low spot," he warned. The work was done in time to keep the river from reaching the top of the cofferdam.

The instant communication between Stiers and Cross in this emergency is just one example of how radio communication between the job officials at Medicine Creek Dam speeded the project and saved money. It works efficiently when things are routine, but it is absolutely invaluable in emergencies.

No longer does Stiers have to drive for hours to hunt his master mechanic, who might very well be traveling only a thousand feet ahead of or behind him. No longer does he worry about following through on the many details a General Superintendent must see to. He depends on his radio set.

"I don't know how we ever got along without radio communication on our jobs," he says today, after admitting he was a bit skeptical at first.

"One day an operator jumped off a machine and lit on his head," Stiers said. "It looked bad; we thought the man's neck was broken. A quick radio call to the office had our ambulance on its way immediately, and we fed the details to the office, where they were transmitted by telephone to the hospital.

"When the man got to the hosiptal, they were all ready to take care of a broken neck. Fortunately his neck wasn't broken at all, which doesn't cut any of the credit from our radio sets."

Key Men Are Connected

All the radio sending and receiving sets are General Electric FM's. Stiers has one in his automobile. There was one in the concrete superintendent's pick-up. The excavation superintendent and all the shift walking bosses had radios in their pick-up trucks. There was also a set in the field mechanic's pick-up, in the mechanical repair shop headquarters, in the batch plant and powerhouse plant.

The main office was the nerve center of the system, and all conversations were heard there. Stiers had an extension from this set leading into his private office. He could hear everything that was going on as his key men discussed it, whether he was in his office, or out on the job in his car.

Many things happen each day which prove what a money-saver this sort of communication can be. For example, the day the Western Editor of this magazine visited the dam, one of the large water tank trucks ran off the road while rounding a curve, and piled into a ditch. The operator, unhurt, was not able to get his truck out.

He got word about his predicament to the first radio-equipped pick-up. Quicker than these words can tell, the Lorain Moto-Crane on the spillway was sent out to straighten the machine up, pull it out of the ditch, and send it on its way again.

According to Stiers, his radio more than anything else takes a lot of the hard work out of job management. When he wants to send word to one of his key men, he picks up his transmitter and goes on the air.

"There's still one disadvantage," Stiers warns. "It isn't always possible to get your man. Cliff Godsey, for example, might not be in his pick-up. He

(*Concluded on next page*)

CUT COST and DO THE JOB

YOU CAN BID LOWER
when you haul your equipment with
MILLER MODEL B

You can bid LOWER because with a MILLER you haul equipment NOT nonproductive steel. Miller as a Tilt Top saves on hauling costs in loading and unloading time.

The Model B all welded taper channel frame is built of pressed steel and engineered to give LOW FIBER stress at areas of highly concentrated loads. The "straight through" axle welded into heavy steel tubing ties the main frame and gives a solid steel support from axle to platform. Dual wheel axle assembly is securely welded with alloy welding rods. Platform is 8' x 14' x 31" high. Tires dual Budd hubs, and wheels are standard equipment. Model B is on IMMEDIATE DELIVERY for only $975. Get a Tilt Top to do your hauling faster and safer.

*Optional equipment below is priced extra.
** TWO SPEED WINCH— allows one man to easily load and unload.
* ELECTRIC BRAKES— give that extra heavy feature so often necessary.
* HYDRAULIC TILT CONTROL—eliminates platform slap. Is safer and easier to control loading of equipment.

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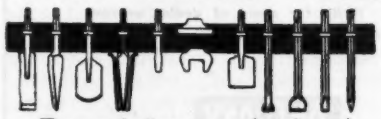
Dept. 310, 727 W. Burnham St. Milwaukee 4, Wisc.

"BICKNELL BETTER BUILT"
PAVING BREAKER TOOLS



We manufacture a complete line of tools for pneumatic paving breakers, rock drills and diggers.
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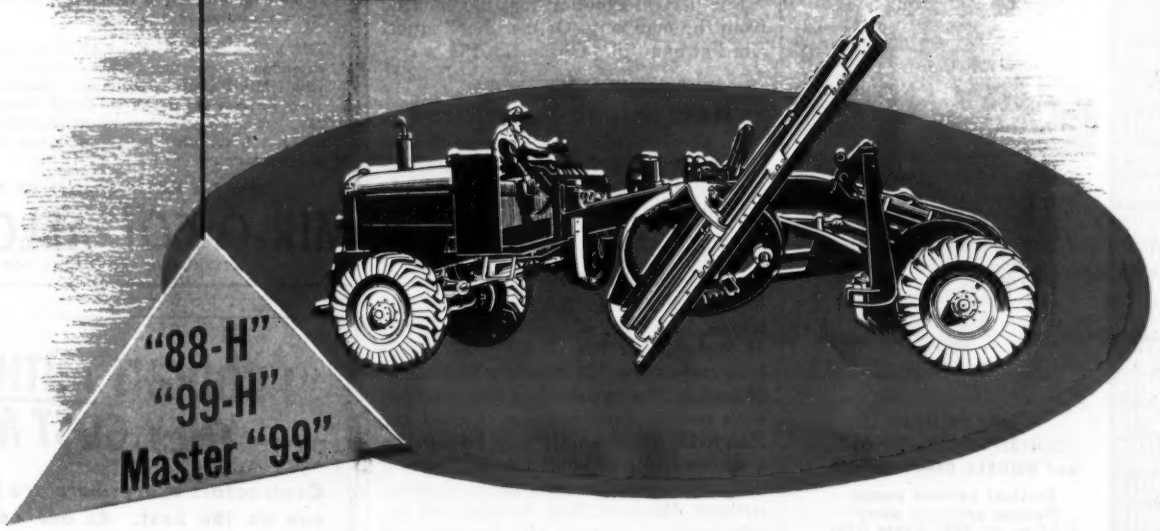
BICKNELL MANUFACTURING CO.
12 LIME STREET ROCKLAND, MAINE

All-Wheel Drive and Steer—High-Lift Blade—Extreme Reach—Full Hydraulic Control

there is No Substitute
FOR ALL-WHEEL DRIVE AND ALL-WHEEL STEER



With All-Wheel Drive, there are no idling front wheels—no dead front end to consume power and decrease operating efficiency. All weight is on driving wheels—front and rear—contributing 100% to traction and utilizing the full power of the engine.

All-Wheel Steer provides unequalled maneuverability; saves time on every job; makes it possible to work in places where ordinary motor graders cannot go—do things they cannot do.

Yes, there is *no substitute* for All-Wheel Drive and All-Wheel Steer in a motor grader . . . no way in which any rear drive, front steer machine can equal the maneuverability, power-at-the-blade, and all-around performance of an Austin-Western "88" or "99."

Get the complete story of the many additional features of these outstanding graders from your A-W distributor, or send for the latest bulletins.
AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

BUILDERS OF ROAD MACHINERY
Austin Western
SINCE 1859

Dam Manager Says Radio Network O. K.

(*Continued from preceding page*)

might be up on top of a concrete pour somewhere. But I knew that if I called him at 5-minute intervals, I'd get him in a few calls. That's still a lot faster than it was in the old days, when we had to track each other down."

Much more important, perhaps, was the fact that any of Stiers' men could reach him any time, if any puzzling problems came up for his attention.

The entire cost of the radio communication installation at Medicine Creek Dam was $6,500. That amount, on a dam costing over $5,000,000, can be saved in a short time through the increased efficiency in operation. It is mighty handy to be able to call the batch plant direct and order or cut off concrete shipments in a minute's notice.

Medicine Creek Dam, a flood-control and irrigation structure across Medicine Creek, is under construction for the U. S. Bureau of Reclamation. (See C. & E.M., Dec., 1949, pg. 20.) Major items in the big project were completed nearly 2 years ahead of Lytle & Amis' most ambitious schedule. Part of the credit for this, says Stiers, goes to his radio communication network.

Air Hose Designed For Paint Sprayers

A new air hose has been brought out by The B. F. Goodrich Co., Akron 18, Ohio, for use as an air line in paint sprayers. It is light and flexible to reduce drag on the operator. The smooth finish of its red age-resisting cover reduces the tendency to accumulate paint and dirt. And its braided construction and strong cotton reinforcement make it suitable for working pressures up to 150 pounds, Goodrich says.

The one-braided type is made in three sizes: ¼ inch of 31/64-inch outside diameter; 5/16-inch of ⅝-inch outside diameter; and ⅜-inch of 11/16-inch outside diameter. The two-braid type is a 7/16-inch size of 49/64-inch outside diameter.

Further information may be secured from the company, or by using the Request Card at page 16. Circle No. 40.

Gasoline Power Units

Three new 4-cylinder gasoline power units have been announced by the Hercules Motors Corp., Canton, Ohio: the Model JX4E, with 3½-inch bore, 4¼-inch stroke, and a displacement of 164 cubic inches; the JX4C, with a 3¾-inch bore, 4¼-inch stroke, and displacement of 188 cubic inches; and the JX4D, with a 4-inch bore, 4¼-inch stroke, and displacement of 214 cubic inches.

These power units are designed for high-speed heavy-duty service. They are available in open, closed, or base-type mountings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 19.

New Steel Sawhorse

A new tubular all-steel sawhorse, adjustable for a variety of heights, has recently been announced by the Broadway Mfg. Co., P. O. Box 252, Waukesha, Wis. This all-welded steel horse is available in three sizes: No. 18-31 is 24 inches long and adjustable from 18 to 31 inches in height, No. 24-44 is 36 inches long and adjustable from 24 to 44 inches, and No. 36-63 is 36 inches long and adjustable in height from 36 to 63 inches. The tubular legs are provided with non-skid rubber feet. Called the Handi-Horse, the unit may be used in a wide variety of applications, and will fold flat for compact storage or hauling, without disassembling. Painted red inside and out, it may also be obtained with a hot-dipped-galvanized or zinc-plated coating. Special sizes can be built to specifications.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 81.

A 3½-S Concrete Mixer

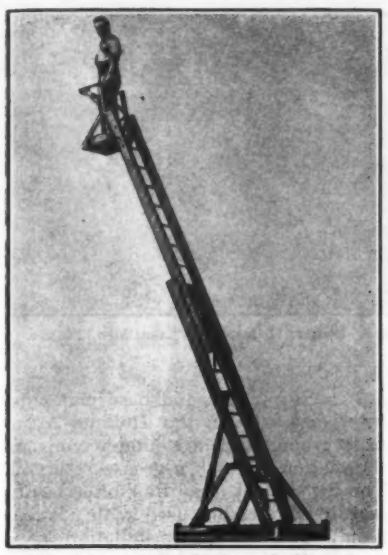
The principal features of the new Rex 3½-S Skipper, manufactured by the Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis., are non-clogging stationary hopper gate, allowing the hopper to be charged while one batch is mixing, and the pivoted Hi-Lo skip hopper. For shoveling, the hopper swings down to a height of 45¾ inches; for charging the batch into the drum, the hopper swings up to a steep 50-degree angle. This one-half bag mixer is powered by a Wisconsin 3.9 hp one-cylinder engine.

The Skipper may be mounted on 5:00 x 15-inch 4-ply pneumatic tires or ⅜ x 3 x 24-inch steel wheels. The mixer is equipped with a 7-gallon vertical syphon-type water tank, tested for 150 pounds of pressure and accurate measurement. Both the frame and the tilting hopper are of electrically welded steel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 70.

One of the principal features of the Rex 3½-S Skipper concrete mixer is the pivoted Hi-Lo skip hopper.

CARTER CARTER CARTER



This new aerial platform ladder, designed for truck mounting, may be manually or hydraulically controlled with up to 60-foot extensions.

New Platform Ladder

A lightweight extruded aluminum extension ladder, manufactured by the Aero Metalcraft Corp., Rockleigh, N. J., is designed for all types of overhead jobs. The ladder, the company says, may be mounted on most material-handling or other truck bodies. For both interior and exterior work, it extends to a height of 28 feet and rotates a full 360 degrees. Other models of this type are available in lengths up to 60 feet.

The aerial ladder is transported in a retracted horizontal position, parallel to the long axis of the truck with the retracted overall length half the extended length. Manual or hydraulic actuation controls the inclination of the ladder to an angle of 45 degrees. A guardrail around the working platform protects the workman.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 90.

For Detecting Metal

A new electronic metal detector, designed to detect any metal in non-metallic materials is announced by the Eriez Mfg. Co., 1272 E. 12th St., Erie, Pa. It consists of two parts: (1) the detector or search coil, usually custom-built to surround the material flow in the inspection area; (2) a water-tight metal control cabinet housing the electronic and control relays which are mounted in any location within reasonable distance for connection to the search coil.

Detection of tramp metal is easy, the company says. The product to be inspected is conveyed by belt to the search coil where it enters an electromagnetic field. If foreign metal is present, the detector is designed to stop the belt automatically or operate mechanical, audible or visual signal devices. The selection of the signal or marking device depends upon the application involved.

Adjustment can be made to detect the particular size of metal that is causing trouble. For example, if only large pieces are creating difficulty, sensitivity can be adjusted so small pieces of metal will not be detected. This device, the company says, will operate effectively on belt speeds up to 900 feet per minute and where magnetic separation cannot be obtained.

The search coil and frame are adjustable in two dimensions to the particular conveying system. The detector is stable in operation and requires no balancing adjustments. It is said to be free from all normal vibration effects and is completely automatic.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 11.

A Correction

A photograph of the Euclid Model 51FDT-15SH, appearing on page 85 of the October issue of CONTRACTORS AND ENGINEERS MONTHLY, was erroneously captioned "largest scraper in the world". The Model E-35 CarryAll scraper manufactured by R. G. LeTourneau, Inc., is larger, having a capacity of 26.1 cubic yards struck and 28 cubic yards heaped.

Heads Austin Research

A. T. Waidelich has been elected Vice President in Charge of Research for The Austin Co., engineering and construction firm of Cleveland, Ohio.

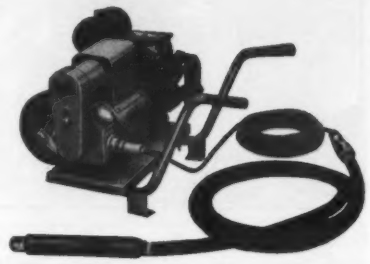
Waidelich is credited with major responsibility for development of the revolutionary H-section welded truss. He joined the Austin organization as a structural designer in its New York district offices in 1936, and has been Assistant Director of Research at company headquarters in Cleveland since 1941.

LIGHTER . . . EASIER TO HANDLE . . .

you place concrete *FASTER* with a

MAGINNISS

HI-LECTRIC CONCRETE VIBRATOR



WHY? Because there's no flexible shaft! No engine to move! The Generator is set off the job, out of the way. Only a lightweight cable runs to the vibrator. One man operates it, the On-Off switch is at his fingertip. 9,500 VPM with no power loss insures faster and more uniform concrete placement.

SAFE? Sure, because generator and motors are wound for 110 volt, 180 cycle operation, and are grounded.

—EXTRA FEATURES—

The Hi-lectric Generator operates 2 vibrators, as well as standard floodlights and Hi-lectric Saws and Grinders. Versatility, light weight, low operating and maintenance cost are just a few of the many advantages of Hi-lectric equipment.

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NOW! The most powerful 6-cylinder Ford Truck ever built!

New ROUGE **254** SIX **ENGINE**

FOR THE HEAVY DUTY F-6

Thoroughly Proved in Industrial Engine and Motor Coach Operation

In Ford Series F-6—110 Horsepower, 212 lbs.-ft. Torque
In Ford Series F-6 COE—106 Horsepower, 210 lbs.-ft. Torque

New Ford 110-H.P. engine plus new 4-speed Synchro-Silent transmission make Series F-6 the standout performer in its class!

THE BRAND NEW Rouge 254 Truck Six gives you new power, new performance in the heavy-duty field.

This 254 cu. in. powerhouse gives you the latest engineering ideas. Free-turn, self-cleaning exhaust valves, faced with durable cobalt-chrome alloy. High-lift camshaft for increased valve opening. Chrome-plated top piston ring for longer cylinder wall life.

You get these and many other new features in the new "Rouge 254" available in Ford Model F-6. You get power that makes the F-6 the most powerful 6-cylinder Ford Truck ever built. You get the brand new 4-speed Synchro-Silent transmission. You get Bonus* Built construction which means big reserves of strength and power. See your Ford Dealer. Get all the facts about the new "Rouge 254," the fourth in a great line of Ford Truck engines.

*BONUS: *"Something given in addition to what is usual or strictly due"—Webster*

THE NEW FORD 254 ENGINE gives you all these modern design features!

CHROME-PLATED top piston ring for better lubrication, longer cylinder life.

AUTOTHERMIC aluminum alloy pistons with solid skirt. Steel strut controls piston to wall clearance.

HIGH-LIFT camshaft for increased valve opening, greater power.

FREE-TURN exhaust valves. Self-cleaning, better seating, longer-lived.

COBALT-CHROME faced exhaust valves for hard contact surface giving longer wear.

HIGH-TURBULENCE Power Dome combustion chambers for more power, greater economy.

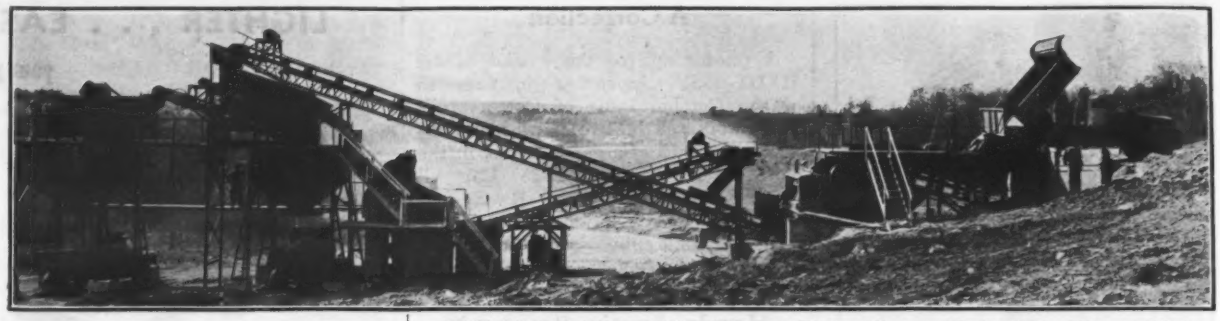
Ford Trucks Cost Less because

FORD TRUCKS LAST LONGER

Using latest registration data on 6,106,000 trucks, life insurance experts prove Ford Trucks last longer!

Maine Quarry Plant

H. E. Sargent, Inc., is operating a new Pioneer Quarry Plant at Vassalboro, Maine. The primary crushing unit consists of a 3042 jaw crusher and a 42-inch x 14-foot apron feeder. Secondary crushing is handled by a 40 x 22-inch triple roll crusher. Other Pioneer equipment on hand includes a 4 x 10-foot vibrating screen, 20 and 21-cubic-yard steel storage bins, and 150 feet of conveyor.



H. E. Sargent, Inc., operates this new Pioneer Quarry Plant at Vassalboro, Maine.

Ratchet Load Binder

A binder for heavy loads on trucks and trailers has been developed by the American Forge & Mfg. Co., 818 Shore Ave., Pittsburgh 12, Pa. The new device, a midget-size ratchet, weighs 13 pounds; its barrel length is 10 inches.

The binder has a full 8-inch take-up so that the load can be retightened at any time en route without having to release the tension or readjust the chain, according to the company. The load binder is of all-steel construction, with Acme screw threads, forge-welded links, and a double-acting spring-loaded pawl. Certified tests report that 8,500-pound tension can be brought up by one man with the integral lever.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 18.

Full Line of Diesel Power

Features of the P&H diesel engines are presented in the latest catalog issued by the Diesel Engine Division of the Harnischfeger Corp., Port Washington, Wis. These engines, the folder points out, are for automotive application, road and construction machinery, electric generator plants, industrial tractors, and pumps and compressors.

Five models are described in the bulletin: 1, 2, 3, 4, and 6-cylinder models with continuous brake horsepowers of 24, 45, 65, 90, and 132, respectively. General specifications for each of these models are given, along with a detailed report on the design and construction features of P&H diesel power.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 121.

Safety Fifth Wheel

A new Holland-Apgar safety fifth wheel is designed to cut highway accidents and reduce transportation costs, according to an announcement by the Holland Hitch Co., Holland, Mich. The new fifth wheel, basically a modification of the conventional wheel, is designed to reduce the danger of the tip-overs during sharp turns and during operation over rough grounds.

The design of the wheel is simple. The upper fifth-wheel plate mounted on the trailer is rigidly locked to the lower fifth wheel by spring-mounted keys. The lower fifth wheel is mounted on a rotating disk and the rocking shaft is offset 4 inches back of the center of the pivot. The company explains that on any turn the center of gravity of the load is moved to the inside—the sharper the turn the greater the move—permitting safer operation on curves. The rocking shaft is mounted on top of the rotary disk, so that it is always parallel to the axle of the trailer. This, the company says, provides a broad platform for the stable 4-point support of the trailer.

The rotary disk and base plates are integral parts of the Holland-Apgar fifth wheel and are under constant lubrication through a grease reservoir. This fifth wheel, according to the manufacturer, is readily used with conventional equipment, so installation in no way limits the use of the tractor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 87.

FOR HEAVY-DUTY PERFORMANCE AND UTILITY
the Preference is . . .
MINNEAPOLIS-MOLINE
MODERN MACHINERY

INDUSTRIAL WHEELERS

Model UTI clearing snow on a construction project helps to maintain contractor's work schedule.

High lift and 2½ yd. controlled bucket for efficient piling or truck loading.

MM Industrial Wheelers are designed to handle a wide variety of jobs with a minimum investment in special equipment. They are of rigid heavy-duty design from radiator to drawbar with a 10,000 lb. capacity on the front end for heavy duty front-end loaders.

Attachments for a wide range of material handling and maintenance jobs include a choice of hydraulic or mechanically operated front-end loaders, dozer and snow plow blades, pull-behind and side-mounted mowers, rotary broom, pull-behind scrapers, single drum winch, and an all-weather enclosed cab.

For complete facts on 27 h.p. RTI or 49 h.p. UTI or UTIL models, see your MM dealer or write—

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RAINCAP

STOPS MOISTURE FROM FALLING INTO TRACTOR EXHAUST . . . Just slip the "RAINCAP" over the open end of your tractor exhaust, and you eliminate forever the danger of moisture falling into the exhaust, injuring your tractor

THE CAP THAT DOES NOT FORGET TO CLOSE . . . Completely automatic—the "RAINCAP" is counter-balanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum with bronze bushing—can be installed in two minutes. F.O.B. Waterloo, Iowa.

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1	2⅛"	$1.90
2	2⅜"	1.90
3	2¾"	1.90
5	1⅞"	1.90
55	2"	1.90
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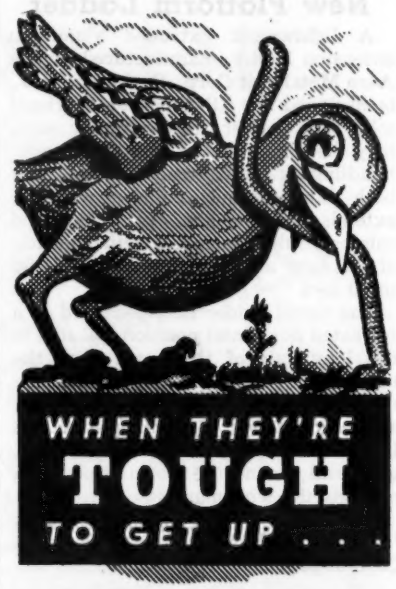
6	1½"	1.90
66	1⅜"	1.90
7	2½"	1.90
8	3"	2.50
9	3⅛"	2.50
10	3¼"	2.50
11	3½"	2.75
115	3¾"	3.00
12	4"	3.00
123	4⅛"	3.00
125	4¼"	3.00
14	4½"	3.00

WATERLOO FOUNDRY CO., WATERLOO, IOWA



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The economy and dependability of Vulcan Pile Extractors in getting 'em up and OUT even under the most adverse conditions has been proved on the job since 1927. Three types for all extracting purposes—No. 200 for pulling less difficult piles, No. 400 for pulling small wood piles and commonly used lengths and sizes of steel sheet piles driven under normal conditions, and No. 800 for extracting the heaviest, longest and most difficult steel piles and all size or length of wood, concrete, H-beam or pipe pile.

Cost saving comes through the Vulcan's proved efficiency, ruggedness and fast operation. In many cases the original cost has been repaid on a single job. Get full details on how Vulcan Pile Extractors can help you gain new efficiency and economy. Write today.

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Reclamation Meeting Declares War on CVA

Record Gathering Scores Totalitarian Authority For Orderly Development Of Major Stream Basins

By RAYMOND P. DAY,
Western Editor

✦ WATER users of the 17 western states do not want a totalitarian "Authority" to dictate solutions to their problems.

That was the unanimous conclusion of almost 1,500 delegates—an all-time record attendance—at the 18th Annual Convention of the National Reclamation Association, held in Salt Lake City, November 2-4, 1949.

Representatives from the west were divided between praise and criticism of the U. S. Bureau of Reclamation and the Army Corps of Engineers, but delegates heard speaker after speaker scornfully reject the proposed Columbia Valley Authority. Even California and Arizona delegates, at each others' throats over division of Colorado River water and the proposed $738,000,000 Central Arizona Project, were unanimously opposed to the creation of an Authority.

Farmers from the "grass roots" of the west, officers of the NRA, representatives of Congress, and Bureau of Reclamation top brass participated in discussions of reclamation construction and water use. Sincere praise and uninhibited criticism of the Bureau of Reclamation was voiced by the various speakers, but throughout the series of sessions one grim fact was made abundantly clear: western water users will fight with every weapon at their command to prevent authoritarian rule.

Reclamation: Big Business

According to Harry E. Polk, President of NRA, reclamation has grown into one of the real major programs of our Federal government. Reclamation appropriations of $14,000,000 in 1931, which grew to $96,000,000 ten years later, have now increased to the unprecedented figure of $354,000,000 for this fiscal year. This sum, already authorized by Congress, has been made available for heavy construction and planning for reclamation in the 17 western states.

Reclamationists should not permit the need of electric-power revenues to mislead them into fostering autocratic government powers, President Polk warned.

"There can be no question," he said, "as to the desirability of fullest possible development of hydroelectric power from multiple-purpose dams. But we should, it seems to me, exercise great care, lest under any mistaken concept of evaluating aids to irrigation, we assume the role of fostering autocratic powers in government, which, under some other name such as 'valley authority', we contend so vigorously against."

Appearing on the same program with Polk were Michael W. Straus, Commissioner of Reclamation, and Governor J. Bracken Lee of Utah, who welcomed delegates by urging them to shun the pressure-group technique of trading votes for something they know is not right, to get votes for something they believe is right.

"When you make those kinds of deals, you are destroying what you should be fighting for," the Governor said.

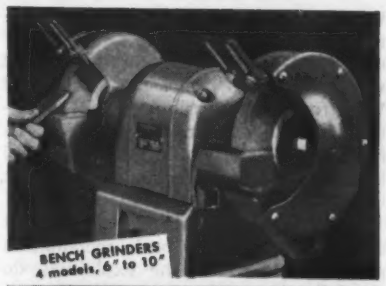
Defends Organization

Polk, in reply to charges that the NRA had become the tool of "special interests" through the inducements of financial contributions through improper sources, took a swing at Commissioner Straus, but it did not provoke a response. Remarking that Straus, at last year's convention, had in substance made such a charge against the Association, Polk added:

"Strong resentment was expressed by your directors, and Mr. Straus was asked to substantiate or withdraw his charges. He has done neither. Substantiation was obviously not within his power. Why he failed in the latter I leave to your own conclusions."

Turning to the charges of Rep. Henry M. Jackson of Washington, questioning sources of the organization's income and its legitimacy as a spokesman for

(*Continued on next page*)



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FOR POWER SPECIFY "Van Dorn" PORTABLE ELECTRIC TOOLS

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B.F.Goodrich

Why you get more recappable tires when you use B. F. Goodrich

IN TOUGH, off-the-road operations like that shown above, mileage doesn't mean much in measuring tire service. Instead, the yardstick is number of hours a tire works and whether or not worn treads can be recapped, or if sharp, jagged rocks cause serious tread cuts.

Reports from B. F. Goodrich users indicate top performance of BFG tires as compared with other brands. For example, one operator reported over 4,500 service hours from B. F. Goodrich *Universals* vs. only 1,600 hours from another make in identical service.

B. F. Goodrich tires stand out in service for many reasons. Tread rubber is specially compounded to resist cutting. More tires can be recapped because they have double bruise protection in the B. F. Goodrich *double nylon shock shield* . . . layers of nylon cord built in between the tread and the body plies.

Only BFG gives you the added protection of the nylon shock shield; the added savings of (1) longer tire life (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires. But nylon shock shield costs no extra — you pay no premium!

Another "special" is the new ALL-NYLON tire for tough construction projects, quarry work, strip mining, etc. In all tests, not a single BFG All-Nylon tire blew out, not one flex break occurred!

There's a specially designed off-the-road type B. F. Goodrich tire for every need. See your dealer or write, wire or phone — *The B.F.Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER
Truck Tires

Reclamation Meeting Declares War on CVA

(Continued from preceding page)

western water users, Polk said:

"The Congressman requested the facts. You are familiar with the efforts of your President to supply those facts. And now I want it recorded that this kind of demagoguery will not again be given the dignity of a reply."

Straus, who was the next speaker, made no reference to this phase of Polk's address.

Polk urged that the Association should continue its efforts to liberalize the basic reclamation act, and that careful consideration be given to the idea of repaying project costs on a crop percentage basis. He also suggested that the Association might seek to bring about cooperation, instead of competition, between Federal agencies and private enterprise.

Federally produced power, whether by reclamation dams or dams constructed by other agencies, should be required to furnish financial assistance to reclamation, Polk said. He called for careful consideration on the part of the NRA before it sponsors any consolidation of Federal agencies as proposed in the Hoover Commission report.

Polk did not advocate repeal of the power preference provision of Federal law, but he did advocate legislation to put it in what he termed "reasonable balance with the proposition that the state affected by Federal power developments should receive an equitable share of that power, regardless of the power policy of the state".

"I am old-fashioned enough," he said, "to believe there is something constitutionally wrong in a situation in which the Government can come into an area, build dams, flood productive land to provide protection for downstream states, generate power at those dams, and then tell any state that the major portion of the power will go to preferred public power agencies in other states unless the state is willing to go public power.

"This situation is confronting a number of Missouri Basin states and other western states, and I think something ought to be done about it: something fair and reasonable."

Power Move Unsound

The president warned that a move, originating in the Columbia River Basin to limit power revenue assistance to the interest component, would render many great western projects financially infeasible. He urged also that Congress be asked to define a power policy, at least in the west, and require administrative agencies to operate within that policy.

Agriculture Encroachment Seen

The ever-increasing encroachment on the reclamation program by the U. S. Department of Agriculture was viewed with alarm by informed reclamation leaders. They interpreted President Truman's comment, in his recent veto of the Vermejo, N. Mex., project, as an indication of the accelerated drive by the Department of Agriculture to get a hand in western reclamation activities. The President had commented with regard to repayment estimates on the Vermejo Project that they "were not reviewed officially by the Department of Agriculture in the usual manner".

Reclamation men said that this was incorrect. They pointed out that the project proposals went through the usual channels, and the fact that President Truman was misinformed was indicative of Department of Agriculture pretensions to unwarranted authority.

Straus Asks Basic Law Change

Support for pending legislation that would lift certain portions of reclamation costs from "the necks of water users and power consumers and put it where it belongs" was asked by Michael W. Straus, Commissioner of Reclamation. The legislation to which he referred, HR-1770, would modernize and liberalize the basic reclamation law, he said.

"It is no revolution," Straus said. "It does not change any basic reclamation policy." But it will, he explained, do the following:

1. Make certain types of allocations of expense of multiple-purpose projects nonreimbursable.
2. Insure permanency of water rights by setting up a low-cost type of repayment contract.

Construction of reclamation projects, Straus held, usually brings benefits other than those of water and power to the consumers of the surrounding community. Such benefits, which Straus said were of value to the nation as a whole, include recreation, sediment control, fish and wildlife preservation, national defense, and transportation. Referring to these benefits, Straus said they should be nonreimbursable. His proposal, he explained, would mean that the nonreimbursable costs would be paid for by the nation as a whole out of the general treasury.

The "low-cost type of repayment contract" Straus mentioned would permit the Department of the Interior to set the period within which the costs must be repaid, according to the economic feasibility of the project. At present most projects have to be paid for within 40 years.

Hearings on HR-1770 are slated to start in January, Straus said, and he suggested that passage of the bill be made the Association's prime target.

Straus complimented the upper-Colorado-basin states for working together so effectively, and said the approval recently by those states of the upper-basin storage program constituted a major step forward in the comprehensive development of the upper-Colorado-river system.

"An absolute essential to further progress is initial agreement among the states as to what projects come first. The Bureau is delighted that the upper basin has cleared that hurdle."

(Concluded on next page)

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Low Operating Cost
Low Maintenance

3 NEW CEDARAPID'S ...ready now fo

HIGH CRUSHING AND SCREENING EFFICIENCY
GOOD PRODUCTION • 100% PORTABLE

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A low priced, simple, heavy duty unit for producing low cost crushed gravel and rock in one pass. Recommended for jobs where the material is screened into only one size, the Single-Pass is ideal for road maintenance work, jobs in locations that are inaccessible to heavier types of equipment and wherever portability and fast set-up are important. High mobility permits inexpensive moving to gravel pits close to the road, resulting in low hauling costs. Extremely low plant maintenance and operating costs are made possible by Cedarapids high quality construction, simple design and the few moving parts. Four sizes are available with either plain or roller bearing crushers; 1016, 1020, or 1024, or 1216 twin jaw. Bulletin SSP-1 gives complete information.

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THE IOWA LINE *of Material Handling Equipment Includes:*
ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATO
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• STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREA

East Is Interested, Too

The fact that the east is interested in western reclamation and has much in common with irrigation farmers was stressed by Kent Leavitt, President of the National Association of Soil Conservation Districts, Millbrook, N. Y. Leavitt told delegates that the 2,200 soil-conservation districts under his leadership "saw eye to eye" with the basic policies of the National Reclamation Association, and pointed out that the two groups could profitably achieve closer cooperation.

Irrigation is not necessarily limited to the western states, Leavitt said, and he told the gathering how irrigation of potatoes and truck crops on Long Island and in New Jersey is beginning to be practiced.

Congress Speaks

Notables from the west, from state capitals, and from the halls of Congress attended the sessions and took an active part. Governors of Idaho, Utah, and Nebraska appeared, and speakers from Congress included Hon. John R. Murdock of Arizona, Joseph C. O'Mahoney, U. S. Senator from Wyoming, and Hon. Wesley A. D'Ewart, Congressman from Montana and a member of the subcommittee on irrigation and reclamation of the Congressional Public Lands Committee.

Speakers from Congress told delegates of reclamation problems and pending legislation. Senator O'Mahoney warned that greed and conflict are reclamation dangers, saying that a "pork-barrel" approach to reclamation or unnecessary conflicts over nonessentials will harm the program and retard development of western resources. At a press conference preceding O'Mahoney's appearance on the program, the Wyoming senator was emphatic in his opposition to stream basin "Authorities".

For long-range success, the senator emphasized, reclamation must appeal to the judgement of all the people of the United States. And to appeal to all the country, he added, the projects must be sound economically.

Advising reclamationists and everyone else to fasten their minds on basic principles and not fight over details, the senator sounded a specific warning against a destructive electric-power fight. He pointed out that the total electric-power potential of the 17 western states is 40,000,000 kilowatts, but that only 14,000,000 are now installed.

"Every resident of this region knows that the demand for power far exceeds the supply", he said.

"Grass-Roots" Discussions

In a series of "grass-roots" discussions which occupied a full day on the convention program, speakers from all the 17 western states summed up their problems, achievements, and solutions. An eloquent argument against farmers selling their independence and freedom of action for Government grants was delivered by George Wilson, Clarksburg, Calif., western representative of the Board of Directors of the American Farm Bureau Federation.

He suggested the reclamationists analyze operating costs of projects under the Bureau of Reclamation and see if they would not be better off by paying interest on Government advances and exercising greater control over their projects. He agreed that reasonable acreage limitations on reclamation projects was proper, but criticized some of the limitations as not being reasonable.

"If the Bureau carries through its plan for the Columbia Valley, we will have Federally established slavery or peonage there," he remarked. Enthusiastic applause interrupted the speaker time and again as he drove home his points.

He maintained that the proposed acreage allowances did not constitute economic units. The aim, he asserted, should be maximum production per farm family rather than the maximum number of families on a project. Having recently returned from a world tour, he mentioned India as an example of the results of placing the maximum number of families on the land. That country, with ample natural resources to support its population, must allow 40,000,000 persons to die of starvation each year, he said.

And the Bureau of Reclamation program, he asserted, is tending back toward the "man with the hoe" idea, rather than the most efficient and productive utilization of the land.

The job ahead, farmers and engineers both agreed, is great. Reclamation construction may soon be as great as the total volume of highway work in the nation.

Polk Re-Elected

Harry E. Polk of Williston, N. Dak., was re-elected to the post of President of the NRA for the coming year.

Proceedings of Highway Conference Are Published

The proceedings of the 34th Annual Michigan Highway Conference sponsored by the University of Michigan, the Michigan State Highway Department, and the County Road Association of Michigan are now available in booklet form. Topics which the conference papers deal with include uniform traffic control devices, retirement benefits for county road employees, roadside park development and maintenance, snow and ice control, soil mechanics, black-top work, and the County Federal-Aid Secondary Highway Program.

Copies of the proceedings may be secured by writing to the Highway Engineering Department, College of Engineering, University of Michigan, Ann Arbor, Mich.

Heads Pump Sales in East

Ralph Thornburg has taken charge of the sales of Marlow construction pumps on the east coast, from metropolitan New York to Virginia. He resigned as Sales Manager of the Pump Division of Yale & Towne Mfg. Co. to take up his position as District Sales Representative with Marlow.

PORTABLE CRUSHING PLANTS

for 1950

THE NEW ROCK-IT

Double-duty performance in one machine! This high capacity crushing and screening unit, all on one chassis, does the work of two single crusher units, *and at lower cost.* It produces "aglime" or road rock or both, with an output of 60 to 80 t.p.h. of 50% minus ½" and 50% plus ¼" to 1" of limestone, crushing from 18" stone down to specification "aglime" in one operation, with one operator. The famous Cedarapids horizontal "Aglime" Screen permits extremely accurate gradation. Quickly set up, the ROCK-IT can be moved around the pit without dismantling. Low first cost, and low operating and maintenance costs increase your saving. Available in three sizes —Model 20 with the 2033 Hammermill, Model 30 with the 3033 mill, and Model 27 with the 3022 roll crusher. All have 18" x 24" primary jaw crushers. Get full details from Bulletin RIP-1.

THE NEW HAWKEYE SERIES

Low first cost, thrifty operation and low maintenance mean better roads at lower costs per mile. Producing from 50 to 75 t.p.h., the Hawkeye plant moves with the job to the nearest gravel bank, saving the cost of long hauls. This sturdy, lightweight plant is 100% portable for easy access to out-of-the-way locations and can be taken over almost any roads and bridges. Extremely low operating costs are made possible by the simple design and use of Cedarapids high quality equipment throughout. The large capacity screen and crusher handle a wide variety of conditions, and produce screened sand as well as accurately sized road gravel. With a Cedarapids Hawkeye on the job site, average gravel can be crushed at lower cost per ton, with savings on maintenance, hauling costs, eliminating pit run boulders and oversize cobbles from the roadway. Four sizes available, with 1016, 1020 or 1024 either plain or roller bearing crusher or a 1216 twin jaw roller bearing crusher. It's a complete plant with closed circuit and it *is* low priced. Write for Bulletin HAWK-1.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

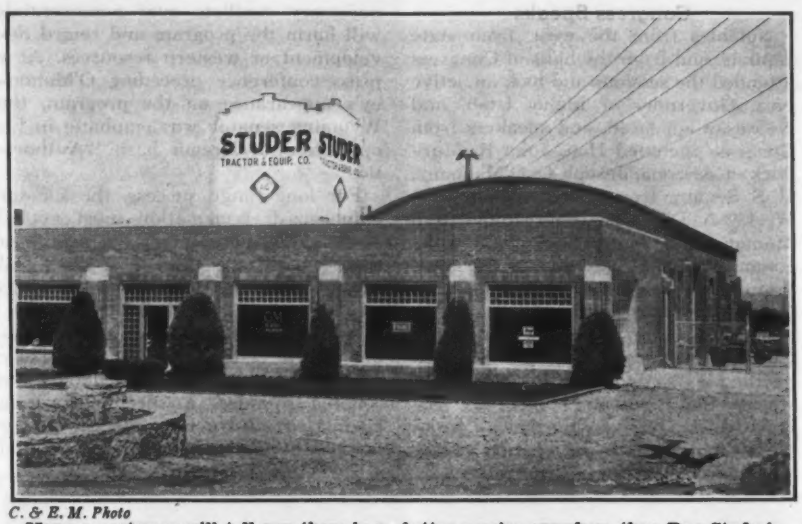
"Service Plus" Drops Cost for Contractor

(*Continued from page* 1)

to get good reports about the west.

Business got worse as construction tightened down more and more, and finally Herb and Ray were both forced by circumstances to do something else. Herb got a job with an equipment firm. Ray bought a hardware store which he ran successfully for 3 years, somewhat, as he says today, "like a bull in a china shop." It was no place for him.

Early in 1940 Herb heard that Allis-Chalmers Mfg. Co. intended to open Wyoming to a distributor. The state was virgin territory then, and A-C had a good opportunity to distribute more of its equipment on some of the work there. It would be a nice franchise if he and Ray could get it. Herb called Minnesota, asking for his brother.



C. & E. M. Photo
Many a customer will tell you there is no better service anywhere than Ray Studer's.

After long negotiations in Milwaukee at the Allis-Chalmers factory, the two brothers landed the franchise. But after raising enough capital to start, they had little else. Ray says today he sold his hardware store, mortgaged his home, and hocked everything including the kitchen sink. Even so, the amount the Studers raised was small for the job ahead.

For better or worse, the Studers' course was set, and in February, 1940, they crossed the Wyoming state line. They had no friends or acquaintances in the state, they knew no one, and they had to figure their own moves in this new territory.

The two established distributors at that time were located in Cheyenne, and they readily explained to Studer that this was because of transportation rea-

(*Continued on next page*)

C. & E. M. Photo
He doesn't just sell his equipment, he displays it. He follows it up on the job.

C. & E. M. Photo
Schramm compressors were one of the Casper, Wyo., dealer's early accounts.

C. & E. M. Photo
Ray himself is seldom in this office. He travels the state by auto and plane.

C. & E. M. Photo
His son Gordon, seated at his desk in an inner office, now heads the sales force.

C. & E. M. Photo
The heavy-equipment repair shop is at the back of the building next to the stockroom.

C. & E. M. Photo
Out in the yard, Ray and his son Gordon pose for a final picture beside an HD-19.

sons. When those companies were set up in the early twenties, the highway and trucking situation was poor, and Cheyenne was the best rail point. Studer examined transportation facilities in the state of Wyoming, its isolated towns and cities, and finally decided that Casper would be his future home. Because Casper is situated in the east-central part of the state, the big territory can be covered to the best advantage from there.

A small brick building on a 2-acre plot of land on East Yellowstone Highway was available in Casper. The Studers picked it up, built themselves each an apartment in it, and started business. They had only a few precious accounts: Allis-Chalmers with Gar Wood and Baker accessories; a hook-up with Schramm for compressors and pneumatic equipment; Bay City shovels; Etnyre distributors; Wausau snow plows; Eagle crushers; Broderick & Bascom wire rope.

Defense work began to boom everywhere but in Wyoming. The Studers were hard-pressed to get equipment. Allis-Chalmers had a 76-day strike. Then a few tractors and one or two scrapers came through. Studer sold them to a contractor who had the toughest rock grading job in the state, near Dubois, and the tough usage soon put Studer in the service business.

The outbreak of the war almost stopped Studer. It was next to impossible to get priorities. During the entire war, Studer sold only two or three tractors on priority. He disposed of the two new machines he had on hand at the outbreak of hostilities, tightened his belt, and prepared for a battle.

"During that time, Herb and I just sat there and watched expenses go on," Studer explained. "We couldn't get anything to sell. The few used tractors and scrapers we picked up we re-built ourselves, re-painted, and sold. There was no overhead, because we could run the business ourselves."

Casper was selected as an Army air-base site, however, and finally there was some construction in the area. In order to help out, Herb took a job with the Army Engineers. Then came the terrible stroke of all time. Studer Tractor & Equipment Co. was low bidder on a purchase for a carload of Allis-Chalmers electricity transformers for the air base, and the Army ruled the purchase out because Herb Studer was working at the air base for the Army Engineers and was still a partner of the firm.

He quickly resigned, but too late to get the purchase approved. This was a heart-breaker. Then an engineer at a Jap internment camp in Wyoming came through with orders for two medium-sized tractors and dozers which Studer still had. The Ohio Oil Co. made arrangements for Studer to keep all of its Allis-Chalmers industrial oil-field engines in repair, which was okayed by Fred E. Cooper Co. of Tulsa, Okla., which held the franchise.

Despite this, however, it was only about enough business to keep the Studers alive. Herb went to work for the Peter Kiewit organization and put his salary into the partnership with his brother to help keep it going. When it appeared that the distributorship would support only one family, the two brothers talked it over. Herb said, "Figure out how much I've got in this business, Ray. If I like the figure, I'll sell. If I don't like it, I'll buy."

That was fair enough. The two men figured it all out, and Herb decided to sell. Today he is the Assistant in Charge of Construction to Thomas W. Paul, District Manager in the Southern California area for the Peter Kiewit Sons Co., with headquarters in Arcadia.

Ray held on. With the advent of V-J Day, he knew the equipment would begin to come through. Then, just as it looked as if the corner had been reached, a vicious strike paralyzed the industry, and for months Allis-Chalmers fought a battle for the welfare of this nation and its construction industry.

With dogged determination, Studer set about to enlarge his building. The main brick structure, with its tower, was untouched. A contractor temporarily out of work offered to finance a heavy-equipment repair shop and unloading ramp to the back of the building. This was done, and as the slow dribble of new equipment began to break through, Studer paid the contractor.

Turning Point Reached

Then came the turning point. New accounts began to pour in; manufacturers searching for good dealers made their arrangements with Ray Studer. Here came Buckeye ditchers, Rosco asphalt distributors, Link-Belt Speeder and Schield Bantam shovels and draglines, Smith and Essick concrete mixers. Before long he had the agency for Johnson batching plants, Gorman-Rupp and Allis-Chalmers pumps, with a complete line of Thor and Schramm air tools. In the mountainous snow country his FWD truck account helped. Winter-Weiss trailers; Pioneer crushers and conveyors; rollers by Southwest, Tampo, and Gebhart; rippers by Southwest, Baker, and Gar Wood; Seaman Pulvi-Mixers; and Jones & Laughlin cable appeared on his account roster.

Business rose, hit a million-dollar gross for one year, and then suddenly in the early spring of 1949, along with everything else, took a dive.

With his usual calm philosophy that everything happens for the best, Studer again tightened his belt and said, "This may be a good thing. It can't be bad. This can only put us on our toes, and if we give better service than ever, costs to the contractors can go down more."

(*Concluded on next page*)

"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R-2 Right Angle Head and Model AS Motor Unit.

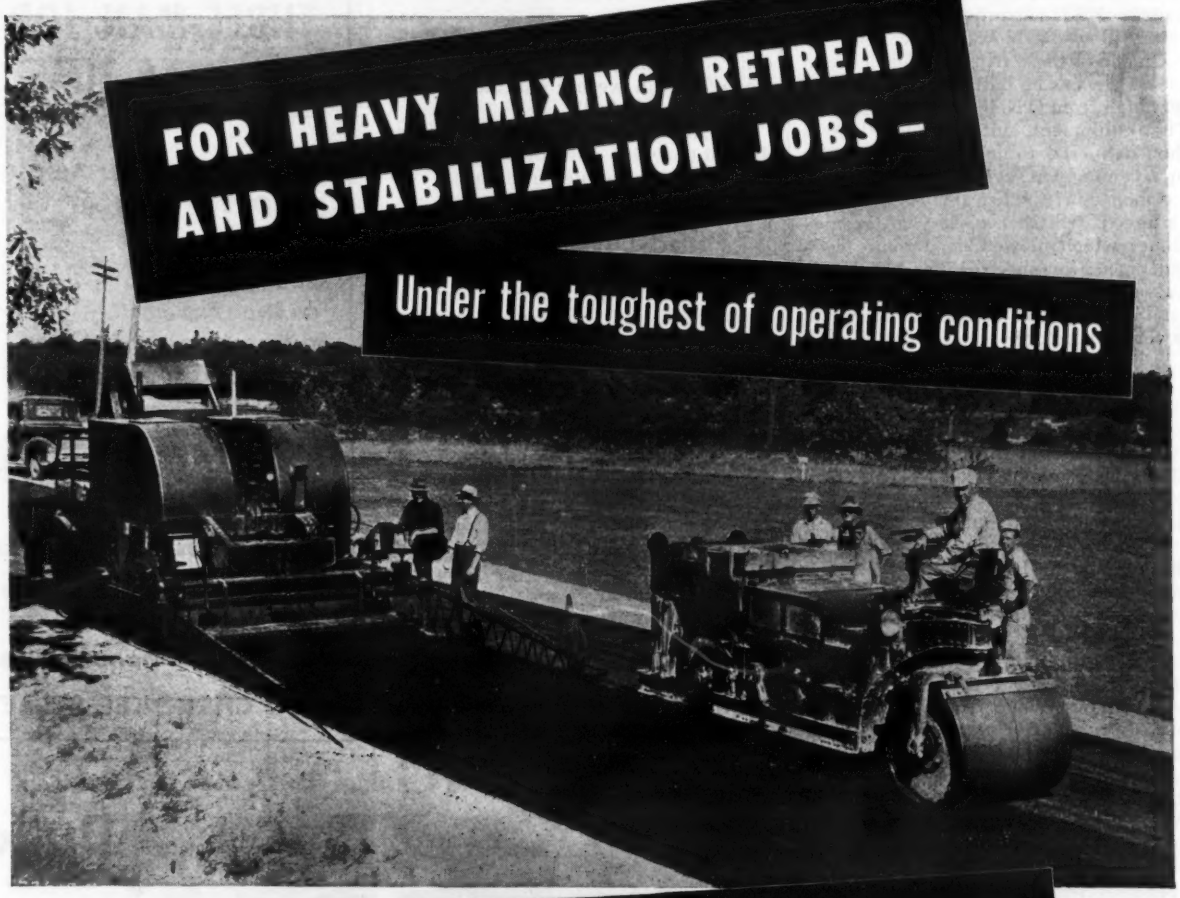
Ideal for surfacing concrete construction and other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.
4665-4669 Spring Grove Avenue, Cincinnati 32, Ohio

FOR HEAVY MIXING, RETREAD AND STABILIZATION JOBS —

Under the toughest of operating conditions



THE NEW Heavy Duty MOTO-PAVER

The Moto-Paver is a very flexible as well as a mobile unit. The illustration shows it being used as a stationary mixing plant.

Although developed primarily to meet the rugged conditions of hilly and mountainous terrain, the heavy duty Moto-Paver is proving equally efficient under widely differing conditions in other sections of the country.

Wherever you have a heavy bituminous mixing, retread or stabilization job, it will pay you to investigate this new and more powerful Moto-Paver. It does the *complete mixing* and *laying job—in one continuous operation.* See your local distributor listed below, or write direct for specifications and complete information on either the heavy duty or standard Moto-Paver.

HETHERINGTON & BERNER INC., 731 KENTUCKY AVE., INDIANAPOLIS 7, IND.

H & B Builds Portable and Stationary
Asphalt Plants of All Types, Sizes and Capacities

"Service Plus" Drops Cost for Contractor

(Continued from preceding page)

Each month he carefully follows his AED business reports, and cooperates to the fullest with that group to turn in the confidential information it needs to prepare the report. Measuring his own performance against the general average in his region, Studer knows how he's doing in a general way, and he can go from there.

During the severe snow emergency of last winter, Studer's organization helped to meet the worst situation of recent years in that region. The January snowstorm had covered the Dakotas, Nebraska, and Wyoming. All the equipment in Studer's yard—3 new tractors and dozers, 4 heavy motor graders, an FWD truck, and a rotary snow plow—were put at the disposal of local ranchers and county officials.

Shop and service men worked around the clock several times that month, often without thought of remuneration. The organization flew one of its service men to Iowa and Wisconsin on three different occasions during the month to deliver FWD's equipped with Snogo rotary plows, V-plows, and wings.

On one of these trips, the service man took 6 days as he battled drifts up to 30 feet high from O'Neill, Nebr., to Casper. The equipment, vitally needed, was then delivered to county organizations in Wyoming. On several occasions service men flew out to ranches, in planes equipped with skis, to service the machines which plowed open some feeding places for sheep. When the battle was all over, Studer and his men were established in Wyoming as they had never been before.

A Traveling Distributor

Quite accidentally, this magazine has several times run across Studer or his men in some mighty out-of-the-way places in Wyoming. This would not be possible if Studer were the desk type of equipment distributor. He is like a contractor's superintendent—always on the go—and he likes it. There may be mud on his feet occasionally, but no grass grows on his service jobs.

By automobile and chartered plane he travels through the state. It's different today from 9 years ago when he didn't know anyone. Today many people throughout the state, including former Governor and now U. S. Senator Lester A. Hunt, know and appreciate the Minnesota contractor who came to Wyoming to begin an equipment business in 1940, with little capital, not too much experience, but a lot of the pioneer spirit for which Wyoming is noted.

A Service Organization

Extensive improvements in 1948 completely revamped the original Studer building, making it a first-class distributor's place of business. The apartments were taken out, all except two rooms in the tower in which Studer's porter stays. (Yes, he has a porter, right off the crack trains of the New York Central lines.) The partitions were all removed. Then they started building from scratch.

Now there is a line of offices down the west side of the building. These open into an outer office and foyer overlooking the main display floor. The stock room is near by, and the back end of the stockroom looks into the equipment repair floor. All finish carpentry is in native Wyoming knotty pine.

Studer has parts and tools to repair any equipment he sells. Occasionally he will get caught short on a part, but if he has a machine of that model on the lot or display floor, he will remove the part without hesitation and send it right out to the contractor. Parts and service go out to the field by service truck or airplane. Recently he flew a small fuel pump for a GMC diesel power unit on a generator up to the northeastern corner of the state, and kept a small city from being in the dark.

Studer's son Gordon heads a sales force of 4 salesmen, each of whom has a territory to work. The repair shop, general service, and parts management is under the supervision of R. J. Brick, with W. C. Wilkes and 2 men in the stockroom. The office is run by Don Brown, who supervises the work of 2 stenographers and the porter. The force now totals 16; 8 of the boys are ex-G.I.'s and 4 are flyers who have their private flying licenses. All department managers are responsible to Studer, who believes that departmentalization is good for a smooth-running organization.

Covering the state of Wyoming, Studer's men range a land which is rough in winter and not easy in summer. Four mountain passes in the territory are practically impassable from November to May. Studer's men always carry heavy protective clothing, tire chains, heavy overshoes, and whatever other protective paraphernalia they need in winter.

And as every man travels over the state, whether to sell or repair or service equipment, he carries Studer's constant admonition, "Fellows, treat the contractors like you would like to be treated if you were a contractor. That means service plus!"

For Ray A. Studer is an equipment distributor with a future, who never forgot what he learned in the past!

Fluid-Drive Motors

A new development in electric-motor design has been announced by the Reuland Electric Co. of Alhambra, Calif. The company's Fluid-Shaft motors feature a single-frame integral design of motor and fluid-drive coupling, and utilize regular Reuland electric-motor frames and end bells instead of special parts. They are designed for use where loads require smooth acceleration and protection from "jamming" and shocks, or where starting difficulty is apt to be experienced. Typical of these installations are conveyors; extractors; and bridge and trolley drives on cranes, winders, and mixers. The units may be obtained in a range from ½ to 10 hp.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 3.

Manages Mack Division

R. W. Walker, Vice President of Mack-International Motor Truck Corp., New York City, has been named Manager of the company's newly created Eastern Division, a territory representing the consolidation of three of the company's major east-coast sales divisions. In his new post, Mr. Walker will direct all Mack truck sales and service activities through the 17 direct factory branches in New York State and northern New Jersey. He will continue to make his headquarters at the Mack Long Island City plant.

The New
TRIPLEX BACKFILL TAMPER

ONE MAN does a THREE-MAN JOB in 50% LESS TIME

TESTED, PROVED AND IN OPERATION AT

GLEN ULLEN DAM
BONNY DAM
GRAND LAKE-BIG THOMPSON PROJECT
MEDICINE CREEK DAM
ANGUSTORA DAM
PAONIA DAM
CHERRY CREEK DAM

For Descriptive Literature, Prices, Wire or Write

GUNDERSON-TAYLOR MACHINERY CO.

Manufacturers and Distributors

970 CHEROKEE STREET • DENVER 4, COLORADO

Build and Maintain with BROKOL

Highway departments and contractors know that BROKOL distributors give them low cost road construction through efficient, dependable operation. The BROKOL full circulating spray bar, with its simple controls and positive shut off, saves both time and material.

Other BROKOL equipment, including tank car heaters, hauling tanks, sand spreaders and street flushers, provide the economical answer to your street and highway maintenance problems.

Write for illustrated catalog on the complete line of BROKOL products.

BROKOL Manufacturing Company, Inc.
89 Madison Street, Newark 5, New Jersey

Convention Calendar

Jan. 15-16—AED Meeting
Annual meeting, Associated Equipment Distributors, Stevens Hotel, Chicago, Ill. Frank G. Knight, Executive Secretary, 360 N. Michigan Ave., Chicago 1, Ill.

Jan. 18-20—ASCE Meeting
Annual meeting, American Society of Civil Engineers, Hotel Commodore, New York City, N. Y. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N. Y.

Jan. 24-27—Sand & Gravel and Ready-Mixed Concrete Associations
Thirty-fourth convention and exposition, National Sand & Gravel Association, and twentieth annual convention and exposition, National Ready-Mixed Concrete Association, Stevens Hotel, Chicago, Ill. V. P. Ahearn, Executive Secretary, 1325 E. St., N. W., Washington 4, D. C.

Feb. 21-23—North Atlantic Highway Officials
Annual convention, Association of Highway Officials of North Atlantic States, Hotel Statler, New York City, N. Y. A. Lee Grover, Secretary, New Jersey Highway Department, Trenton, N. J.

Feb. 21-24—Engineering Exposition
Fifth annual exposition, Minnesota Federation of Engineering Societies, Minneapolis Armory, Minneapolis, Minn. Brede Inc., 1720 New Brighton Blvd., Minneapolis 13, Minn.

Feb. 27-March 2—AGC Convention
Annual convention, Associated General Contractors of America, Inc., The Palace Hotel, San Francisco, Calif. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

Feb. 27-March 3—ASTM Meeting
Committee week and spring meeting, American Society for Testing Materials, Hotel William Penn, Pittsburgh, Pa. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

March 6-9—ARBA Meeting
Annual meeting, American Road Builders' Association, Netherlands Plaza Hotel, Cincinnati, Ohio. Charles M. Upham, Engineer-Director, International Bldg., Washington 4, D. C.

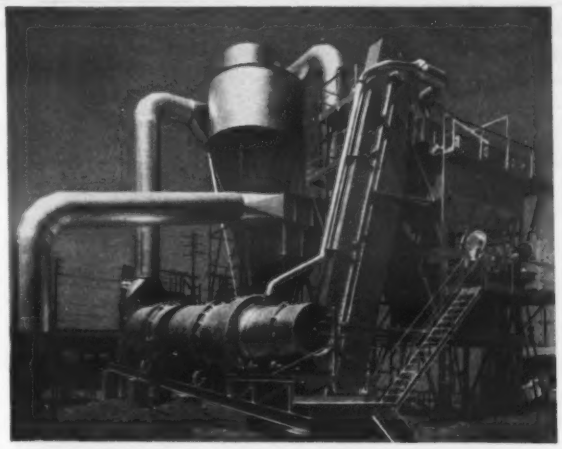
April 26-27—Transportation Congress
Third Highway Transportation Congress, National Highway Users Conference, Hotel Mayflower, Washington, D. C. Arthur C. Butler, Director, National Press Bldg., Washington 4, D. C.

Ky. Department Reports Progress to "Shareholders"

The aims and achievements of his State Highway Department are no mystery to the Kentucky citizen—not when he's treated like a stockholder in the Department and receives a progress report from Commissioner John A. Keck. "Fellow Kentuckian:" the Commissioner's accompanying letter begins. "Every large corporation provides a report for the information of stockholders. Since you are a stockholder in the Kentucky Department of Highways, we are sending you the enclosed booklet for your information."

The booklet is mostly pictorial. For example, in the first section on bridges, a few paragraphs telling how many bridges there are in the state and how many are substandard is enlivened with a two-color drawing of a bridge. Then comes a simple map of the state indicating the location and number of bridges and grade separations under contract or completed. And finally, two pages of photos show bridges under construction. The remaining sections on urban highways, main highways, rural roads, and maintenance receive much the same kind of informal eye-catching treatment.

When the Kentuckian finishes the progress report, he has a pretty clear notion of the big job his Department has done and the big job still ahead. He has learned where highway money comes from, where it goes. Most important, he has realized how much highway costs and highway needs have increased in the last 10 years. The chances are that he has a clearer picture of his own responsibilities in the highway picture—and that he will support more actively a highway department that treats him as if it really needs him.



STANDARD

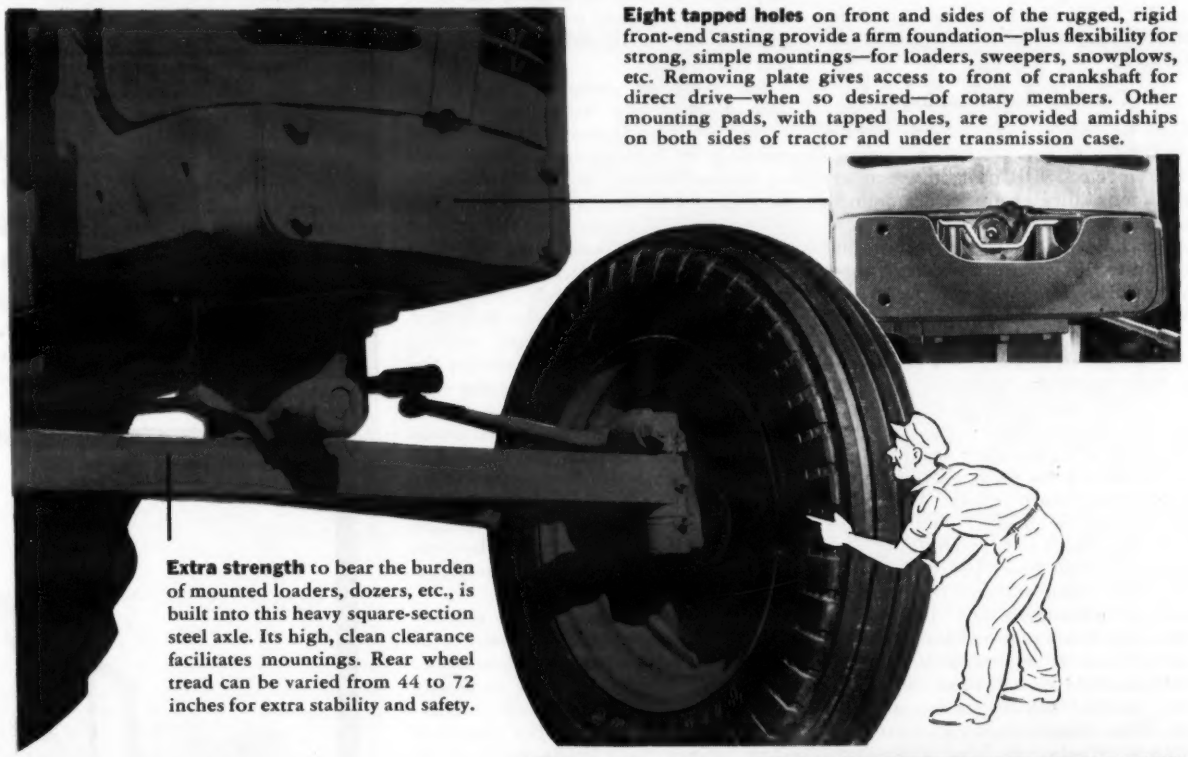
Black-top mixing plants

IMMEDIATE DELIVERY from stock

STANDARD is one of the oldest and largest builders of paving plants—many types for all conditions. Used throughout the world. Modern, Unit-built, easy to erect and transport.

Write for free catalog

STANDARD STEEL CORP. 5007 Boyle Avenue Los Angeles 11, Calif.



Eight tapped holes on front and sides of the rugged, rigid front-end casting provide a firm foundation—plus flexibility for strong, simple mountings—for loaders, sweepers, snowplows, etc. Removing plate gives access to front of crankshaft for direct drive—when so desired—of rotary members. Other mounting pads, with tapped holes, are provided amidships on both sides of tractor and under transmission case.

Extra strength to bear the burden of mounted loaders, dozers, etc., is built into this heavy square-section steel axle. Its high, clean clearance facilitates mountings. Rear wheel tread can be varied from 44 to 72 inches for extra stability and safety.

Only Tractor of Its Size BUILT for FRONT-MOUNTED Equipment

● There is one tractor in the 2500-pound class designed all the way through to work with front-mounted equipment. Besides its structural strength and strategic locations for mountings, the Case Model "VAI" provides rotary motion at any or all of three places—the crankshaft in front, pulley shaft on right side, and regular power take-off at rear center.

The Case "VAI" is a complete tractor. It needs no costly changes or extras in order to stand up under mounted equipment or other heavy duty. Electric starting and lighting are standard equipment. Let your Case industrial dealer show you how much your money will buy in the "VAI." J. I. Case Co., Racine, Wis.

Service when you need it. Your Case industrial dealer is located to serve you conveniently, staffed and equipped to serve you well. Besides Case tractors and engine units he offers related equipment such as tractor-mounted loaders, mowers, snowplows, sweepers, bulldozers and scrapers. Specializing in the power and equipment problems that prevail in your area, he has broad experience that can be helpful to you, in the selection of units best suited to your work, as well as in their management and maintenance.

CASE

SASGEN
New Electric-Powered CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom

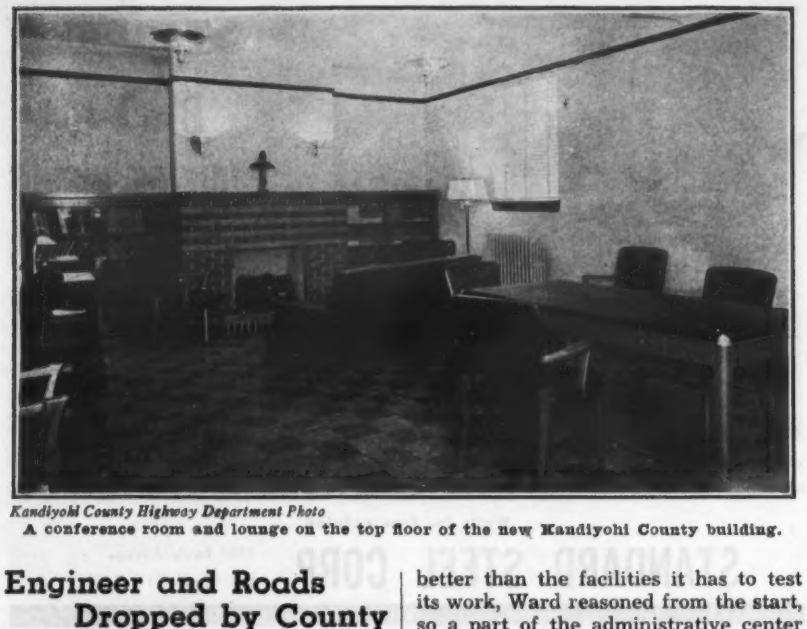
Single line cap. 300 # @ 100 feet per minute

Double line cap. 600 # @ 50 feet per minute

A complete line of Builders' Derricks and Winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3101-27 W. Grand Avenue, Chicago 22, Ill.



Kandiyohi County Highway Department Photo
A conference room and lounge on the top floor of the new Kandiyohi County building.

C. & E. M. Photo
The upstairs floor of the new Kandiyohi building contains a large drafting room.

Engineer and Roads Dropped by County

(*Continued from page 3*)

way. By doing this first, later construction and maintenance was greatly accelerated.

Central Cost Keeping

Costs, records, and, in fact, a running history of every business transaction connected with transportation are the responsibility of a central administrative department. It was a problem, at first, because simple county books that conform to the law were not easy to set up. Marjorie Holmgren, the personable one-woman bookkeeping department, says that she is getting it under control.

Any single equipment part of the entire large stock, for example, is logged in on a receiving report, and then stock-carded while it remains in the parts bin. Stock cards are absolutely accurate, and as a check to keep them so, the county runs an inventory every 4 months. When a part is checked out, the mechanic reports what machine it was installed on, and many years from now anyone can look up and find out all about the transaction.

The office force required for this work is not as large as one might think. One full-time clerk takes care of the stockroom, assisted sometimes by a spare man. The cost-accounting set-up is operated largely by Miss Holmgren. Daily reports by maintenance men, construction foremen, surveyors, and others who are active in the transportation system, furnish the basis for her books.

Laboratory Facilities

No construction department is any better than the facilities it has to test its work, Ward reasoned from the start, so a part of the administrative center at Willmar consists of a testing laboratory. Here are located most of the items of testing equipment to check the characteristics of soil, aggregate, cement, and concrete.

Soil sampling comprises the major part of laboratory work. Samples are made in waxed-paper cartons, and stored in the laboratory until such time as the technician can get around to them. A great deal of soil testing is done in the winter, and a guide to the interest shown by all the men is the fact that everybody wants to help in the lab. Ward knows—because it has been proved—that every hour the field men can spend in the laboratory making tests is a wonderful investment for the next season, because it broadens each man by just that much.

Laboratory control on construction done by county forces is just as rigid as on contract work. However, since Ward believes in the efficiency of the contract system to the point where he will fight for it, all of the new work is let by contract. County force-account work is limited to maintenance.

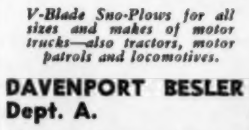
Over and over again, Ward emphasizes one thought: that a transportation system can be built and maintained best if the central directing authority confines its activities to supervision, administration, and testing. The danger of going beyond these limits, he believes, is that the men are then too prone to lose their perspective.

Human Engineering

Usually, when a man tries something such as Ward has set up, on a bunch of old-timers, you hear certain complaints which sound pretty much the same. You hear it said that the outfit is doing too much bookkeeping and little else. You hear it said, when a recorder is installed on a piece of equipment, that the outfit is slave-driving and cost-conscious.

In answer to these old sayings, Ward will take the chance of a stranger sitting in when the small force of men

(*Concluded on next page*)



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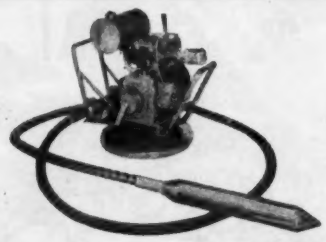

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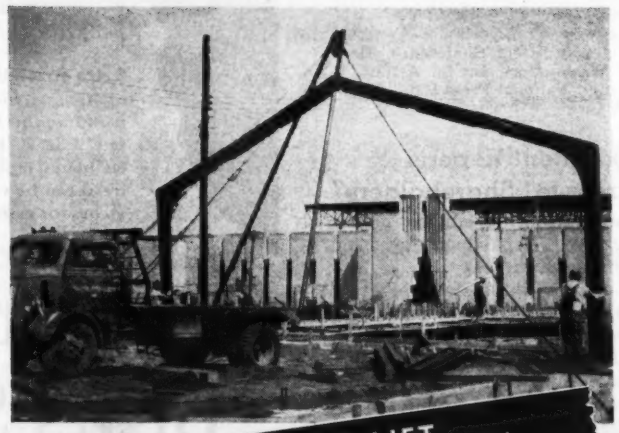

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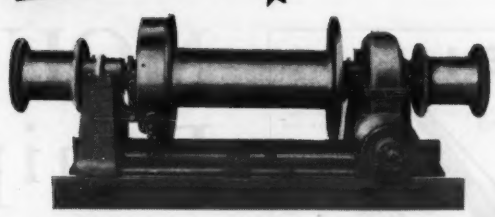

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Tulsa Winch
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check out of the shop about 7 a.m. and start for their daily task. The men come in quietly, they talk pleasantly with the usual banter of construction stiffs, they make certain that their report is turned in with the recorder card for their machine, and they voice no snide remarks or complaints.

For they have come to know that these reports and recorder cards have a definite place. Many of these decisions they arrived at themselves. And it can also be said here, without editorializing in an article, that these men are visibly top-notch; just as their wide, smooth transportation system is far superior to the many miles of rutted, crooked, unsurfaced "county roads" elsewhere in the country.

Ward recognizes that in suggesting good reports, he really places the burden of responsibility on himself. For it is up to him, and to Eugene Erickson, his Maintenance Superintendent, to make use of these reports. They do this by personally checking every sheet every day, and occasionally using them as a basis for the introduction of new short cuts or other kinks to reduce costs.

In that case, the maintenance man is contacted as a partner rather than as a subject for criticism. The relationship is ideal. Administration points out the need for a change; experience racks its brain and comes up with an answer.

The men have learned, these last 10 years, that they are not being checked up on. They know that if any man needed checking up on, he wouldn't stay very long. Most of the 35 men have been with the County as long or longer than Ward.

Regular monthly conferences in the comfortable, almost lavish lounge and library upstairs, are a very important part of human relations. According to Ward, one of the most interesting series of conferences he ever attended in his life happened in that meeting room . . . when every man was given a chance to say why he liked to work for the County, and why, if things were changed, he would like it better.

Some of the plain-spoken Scandinavians really opened up.

Ward listened. Then he accepted and acted on the recommendations that were sound. He installed a suggestion box to keep the ideas coming.

County Attorney Hendrickson, Ward's close friend, often accuses him of playing dumb, like a country boy. Maybe so, but Ward insists strongly that a supervisor or administrator must broaden and grow up with the men who work for him. No program can go ahead faster than each of the men who have a part in it.

He can prove that belief to practically anyone's satisfaction by pointing to his transportation system. Progress was a little slow while the central administrative control was being created. Then, as the emphasis shifted to the field, the system began to quicken and take shape. Today's projects go in with speed, efficiency, and order.

We were frankly cynical about the whole thing, just as some of you may be. It sounded too naive.

"What part of your budget goes out on the roads," we wanted to know, "and how much does this 'administration' cost you?"

Ward smiled, as if he knew how surprising the answer would be. "Add it up for all of last year, Marjorie," he said.

Miss Holmgren had it in 5 minutes.

Total budget: $321,102.49. Administration and supervision: $17,780.21.

Five and a half per cent!

All readers who can do it for less, please advise.

C. & E. M. Photo

This Walter truck in the Kandiyohi County equipment yard pulls a semi-trailer in summer. In winter it takes the brunt of snow removal.

Link-Belt Houston Plant And Duluth Sales Office

Link-Belt Co., Chicago, Ill., has opened a new plant in Houston, Texas, to make elevators, conveyors, and power-transmitting machinery. It is located on a 10-acre plot of ground at 3203 S. Wayside, and comprises approximately 45,000 square feet of floor space. It includes a one-story all-steel factory building with three bays, and a two-story office section of masonry construction in front. Vivrett & Vivrett was the contractor. Allan Craig, General Manager of Link-Belt's Southwestern Division, has his headquarters at the new Houston plant.

The company has also opened a district sales office in Duluth, Minn., at 422 Board of Trade Bldg., 310 W. First St. John E. Morrison, formerly District Sales Engineer at Chicago and Minneapolis, is District Manager in charge of the new office. Harold A. Ivarson is assisting him.

West Virginia Turnpike

A turnpike, probably north-south from Moundsville to Bluefield, is up for discussion in West Virginia. A commission named by Governor Okey L. Patteson has already held its first meeting to discuss possible routes and financing of the toll highway. Members of the commission are D. Holmes Morton, Chairman, of Charleston; William G. Stathers, Clarksburg; Frank S. Easley, Bluefield; and Edward J. Flaccus, Wheeling.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

When May Contractors Abandon Jobs?

When is a highway contractor justified in abandoning a job? When the state, county, or other public authority delays his progress payments or delays the start of his work? When the authority makes a mistake in a work order? When, despite a statute requiring it to, the public authority fails to acquire title to land before inviting bids and signing a contract?

Here is what the courts have had to say on these issues.

Delayed Payments

Under a conventional construction contract which provides for progress payments, the contractor's agreement to perform the work depends upon the other party's agreement to make the payments substantially at the times specified in the contract. If the other party fails to make payments when they are due—*and if there are no other provisions or circumstances excusing failure to pay*—the contractor is justified in refusing to complete the work. So the United States Circuit Court of Appeals, Fourth Circuit, noted in the case of Pickens County, S. C., v. National Surety Co. (1926) 13 Fed. 2d 758.

However, in this particular case, in which the contractor had abandoned the job for non-payment of estimates, he had been overpaid on previous estimates, and had indicated his intention to waive delay in the particular payment. The court decided that under those circumstances he had no right to abandon the contract.

In another case (United States Fidelity & Guaranty Co. v. Robert Grace Contracting Co., 1920, 263 Fed. 283) the United States Circuit Court of Appeals, Third Circuit, intimated that failure to make a monthly payment punctually does not necessarily justify abandonment of a job. That abandonment is justified only where refusals to pay installments are *persistent*, or where circumstances indicate *inability to pay* or *determination not to pay the installments due as well as future installments.*

The late Judge Cardozo wrote an opinion on this matter when he was judge of the New York Court of Appeals. (Anderson v. John L. Hayes Construction Co., 243 N. Y. 140, 153 N. E. 28.) In the case at point, drafts drawn on a county treasurer to cover progress payments were dishonored. The state failed to make good the dishonored drafts. And the contractor quit the job.

He was entitled to quit, said Judge Cardozo. He might not have been if the state had sought a reasonable opportunity to provide the necessary money after the county treasurer's default. But the state did not take that action. When it was informed that the drafts had been dishonored, it did not offer to make them good. It merely told the contractor to proceed. And when he refused, it gave notice of a re-letting.

The state's theory seems to have been that it was not in default because the county did not pay; that in the end, remedies would be available to make the county pay. But meanwhile, "the contractor must wait, and, while waiting, must perform".

"But that is not a fair construction of the contract," said Judge Cardozo, "or of the obligation of the state thereunder. The contractor was not to be involved in quarrels between state and county. . . . The state had covenanted to pay. The covenant was broken if payment was not made, whether an insolvent bank, or a recalcitrant county, or any other misadventure was the occasion of the breach". And if the breach was not repaired, the contractor was justified in quitting.

Delay in Start of Work

If a public authority delays the contractor in starting work, can he refuse to perform?

A Pennsylvania county road construction contract required the relocation of a township sewer-siphon system, subject to approval of the township commissions and the state Board of Health. A clause in the contract gave the contractor an option to discontinue performance on 10 days' notice if the work should be delayed three months by the public authority.

There was a delay of more than three months in securing approval of the sewer alterations by the township and state authorities. The contractor quit. He was justified in doing so, said the United States Circuit Court of Appeals, Third Circuit, 1941 (Frank v. Allegheny County, 119 Fed. 2d 614). But the delay did not render the county liable in damages.

In another Pennsylvania case (Acchione v. Commonwealth, 347 Pa. 562, 32 Atl. 2d 764) a highway contractor knew that there were certain utility facilities on the site that must be removed, and the contract provided that he should not be required to proceed if, without his fault, work could not be commenced within three months. The contract did not specifically obligate either party to secure removal of the facilities, but it did require the contractor to notify the owners of structures within the site to remove them. The Pennsylvania Supreme Court decided (1943) that the contractor could "treat the failure to clear the site as a temporary impossibility and refuse to perform". But, by continuing the work, he "assumed the risk of delay and cannot now be heard to complain".

Mistake in the Order

A contractor cannot seize upon a mistake that has not prejudiced him as an excuse for abandoning a contract.

A county board issued an order suspending all work on pending road construction because of a shortage of funds. But it speedily corrected the order to exclude a particular job from the suspension. Contractors on that job said they were released from performance (Wyoming County Court v. Winston, 282 Fed. 472). But the United States Circuit Court of Appeals, Fourth Circuit, held that they were not.

It was not a case, said the court, in which one party repudiates a contract and afterwards tries to recall the repudiation. Rather, it was a case in which one party made a mistake and the other party sought to take advantage of that mistake.

Plaintiff contractors could not justly claim release from their obligation because the mistake did not prejudice them. They did nothing in reliance upon the mistaken order which they otherwise would not have done; they took no steps which might have disqualified them from performing the contract or which increased the hardship of its performance in any manner.

Land Title Not Acquired

A former New York statute required county supervisors to acquire title to land for a highway improvement before the State could invite bid proposals. A contractor who abandoned a job held that his contract was void because it was made before title had been acquired (People v.

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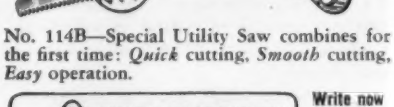

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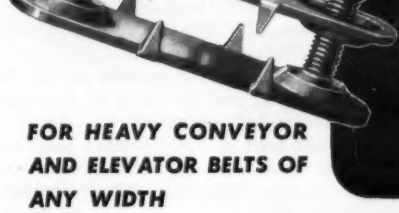

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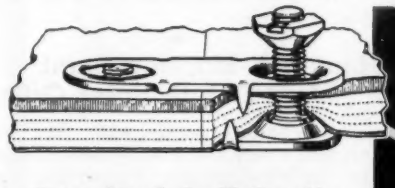

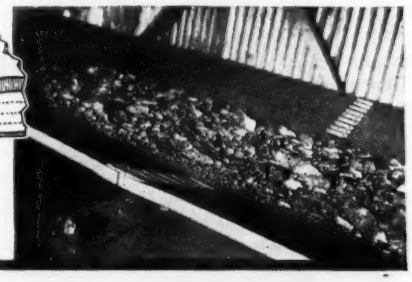

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Karr, 240 N. Y. 348, 148 N. E. 546). But the New York Court of Appeals decided (1925) that the contract was not rendered void in the sense that the contractor could abandon the job.

The court said that the statute was not intended to be mandatory, but was a means of assuring both state and contractor that the work might proceed without unreasonable interference or delay. If a contractor is materially impeded because right-of-way has not been acquired, he may be justified in abandoning his contract. But not always. If lack of title does not seriously interfere with the work, and if upon notice to the state the defect is promptly remedied, he is not justified. "He may not precipitately abandon the work without reasonable opportunity of the state to make good".

False-Claims Statute Applied to Federal Job

THE PROBLEM: *The Federal statutes provide that one who obtains payment from the Government under false representation is liable to it for a $2,000 penalty, plus double the amount of damage sustained by the Government. A cost-plus contractor concealed from the Government the fact that equipment for which rental was charged actually belonged to him, and not to the ostensible owner, a third party; a higher rental was applicable to third parties' equipment than to that owned by the contractor. Did the statutes apply to these payments received by the contractor?*

THE ANSWER: Yes. (United States v. Grannis, 172 Fed. 2d 507, decided by the United States Court of Appeals, Fourth Circuit.)

The contract called for work on a military camp, for which the contractor was to be reimbursed for his expenses, and paid a rental for his equipment and a fixed fee. The fixed fee was to cover complete compensation for his services, including profit and overhead expenses. The court said: "He had been given the contract after demonstrating that he had the resources to prosecute the work, but when he found that additional equipment was needed, he obtained it in the name of another rather than in his own name so as to increase the profits."

The Court of Appeals ordered judgement in favor of the Government for $20,000—$2,000 penalty for each of ten payments that were obtained by the contract through misrepresentation—plus $64,710.06, double the amount of damage sustained by the Government. But the court rejected the Government's contention that it was entitled to a $2,000 penalty for every unlawful act committed by the contractor. The court permitted assessment of a penalty for each of ten false vouchers under which payments by the Government were obtained, but refused to allow additional penalties for each false statement contained in documents attached to the vouchers.

Cost-Plus Contractors Lost Right to Payment

THE PROBLEM: *Were contractors on a cost-plus basis entitled to collect where they failed in reasonable supervision of the work and permitted gross waste?*

THE ANSWER: No. (Shaw v. Bula Cannon Shops, 38 So. 2d 916, decided by the Mississippi Supreme Court.)

The case involved remodeling of store buildings, but obviously the following declarations made by the Mississippi Supreme Court are applicable to all sorts of construction jobs undertaken on a cost-plus basis:

"Upon reason and authority, where a person agrees to do work for another upon a cost-plus basis, it is his duty to keep accurate accounts of all material used and labor performed, with the names of the materialmen and laborers, so that the owner may check up the same. He must use the same skill and ability as is used in contract work for a gross sum. If the aggregate cost of the work upon the face of the account is so excessive and unreasonable as to suggest gross negligence or fraud, the law would impose upon the contractor the duty of establishing the bona fides of his performance of his work. The contractor does not have the right to expend any amount of money he may see fit upon the work, regardless of the propriety, necessity, or honesty of the expenditure, and then compel repayment by the other party, who has confided in his integrity, ability, and industry. . . . In an action upon his contract for payment, the contractor must show that the moneys which he claims to have expended were necessarily paid for materials and work upon the job, and if the contractor fails to do this he should only be allowed the reasonable cost and his percentage." Here the court cites decisions to the same effect, rendered by the appellate courts of Virginia and New York and by a Federal court.

Showing that dishonesty or corruption is not essential to loss of the contractor's rights, the court said:

"The proof does not show any dishonesty or corruption on the part of the contractor but it shows that through needless extravagance, waste, and negligence, or lack of supervision, a very large percentage of the materials charged against the work never found their way into the completed structure."

Suggested Work Method Was Not a Direction

THE PROBLEM: *A contract to construct a bench flume on a reclamation project did not specify whether the concrete should be poured monolithically or otherwise. A Government inspector suggested that separate pouring of the sides and bottoms, as shown by a sketch delivered by him to the contractor's superintendent, was a preferable method of construction. The suggestion was adopted without protest. Was the contractor entitled to be reimbursed for the resulting cost of construction above the regular contract price?*

THE ANSWER: No. (Morrison-Knudsen Co. v. United States, 84 Fed. Supp. 282, decided by the United States Court of Claims.)

The court noted that the construction superintendent did not regard the inspector's "suggestion" as a direction, in which case a protest would have been necessary under a provision of the contract.

The court decided that failure to protest was not excusable on the ground given by the superintendent—"that though he had not been directed to use the nonmonolithic method, he thought that if he did not use it, the . . . inspection would be so severe and meticulous that any advantage . . . gained from the monolithic method would be destroyed, and that, therefore, he was coerced" into using the inspector's suggested method. The court said that it could not permit the superintendent's impressions, not supported by any evidence, to displace the plain requirements of the contract.

Right to Be Released From a Mistake In a Bid

THE PROBLEM: *Through overlooking a sheet of computations upon which a bid for the repair of concrete substructures for a city was based, a contractor made a bid of $143,171 instead of $193,421. The mistake was discovered the day after the bids were opened. The next highest bid was $205,395 and the highest was $334,604.*

Before the contract was awarded and promptly after the mistake was discovered, the bidding company notified the city and asked to be relieved from the bid. But the city awarded the contract to the company and forfeited the $5,000 deposit that accompanied the bid when the company refused to enter into a contract on the basis of the erroneous bid. Was the company entitled to compel the city by suit to cancel the bid and refund the deposit?

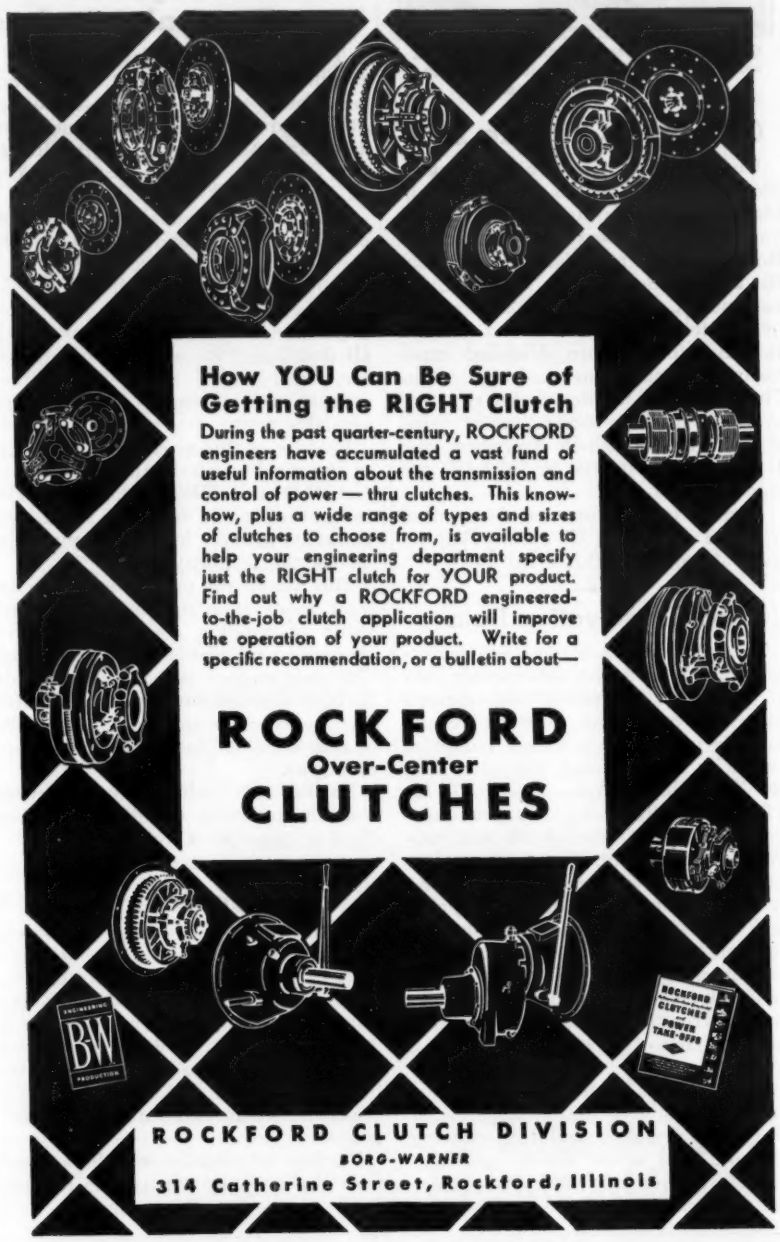
THE ANSWER: Yes. (Conduit & Foundation Corp. v. Atlantic City, 64 Atl. 2d 382, decided by the New Jersey Superior Court, Chancery Division.)

The court decided that in a case of this kind, the essential conditions to the bidder's right to a cancellation are: (1) the mistake must be so serious that to compel compliance with the bid would be unconscionable; (2) the mistake must relate to a vital feature; (3) it must have been made despite use of reasonable care to avoid mistakes; and (4) the circumstances must be such that cancellation will not seriously prejudice the public body that received the bid. The court decided that all of those conditions existed in this case.

Interest on Excess Costs

THE PROBLEM: *Is a Government contractor entitled to include interest on a claim for excess costs resulting from delays caused by the Government where there is no statute and no provision in the contract covering right to interest?*

THE ANSWER: No. (J. B. McCrary Co. v. United States, 84 Fed. Supp. 368, decided by the United States Court of Claims.)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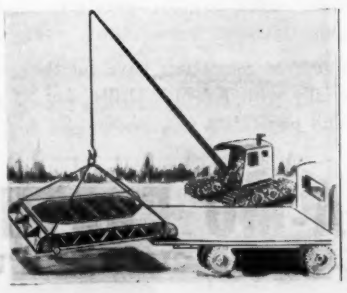

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Soil-Conservation Data

The role of earth-moving contractors and equipment in the nation-wide battle to protect, improve, and expand America's productive farm and range lands is portrayed in a new pamphlet issued by International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Describing the background and scope of the vital soil-conservation and reclamation movement, the booklet warns that the task is a challenge to contractors—"The backlog of work is practically incalculable and the time to complete the job definitely limited." It presents a news-feature style of report on latest techniques and tools used to expand irrigation activities and to meet the problems of erosion and invading brush.

Action photos of International tractors illustrate clearing, raking, chopping, chain dragging, and deep-plowing mesquite and other woody growths; building terrace and waterway protective systems; leveling and grading land for irrigation. Brief captions give job details, costs, and owner reports of tractor performance.

Copies of Form A-456-MM, "For the Land's Sake", are available from the company. Or use the Request Card at page 16. Circle No. 51.

New Welding Process For Stainless Steel

The inert gas-shielded metallic arc-welding process, Aircomatic, may now be applied to the welding of stainless steels and aluminum bronzes, according to an announcement by the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

Briefly, the Aircomatic welding process revolves around the continuous feeding of a coiled wire electrode in a gaseous shield through the barrel of a welding gun. High-speed continuous deposition of filler metal is possible in all positions with a completely visible arc, according to the company. Both manual and automatic equipment are available.

Feature of this process when applied to the welding of stainless steel is the fact that the filler metal is carried across the arc and deposited in the weld virtually without loss of alloying elements, the company says.

The Aircomatic process is said to deposit more stainless steel at a given value of welding current and hence minimize heat effects in the base metal. The weld surface is dull, but it grinds, buffs, and polishes to any desired finish. The welds are sound, without porosity or slag inclusion, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 15.

Wooden-Sole Shoes

A full line of wooden-sole safety shoes is offered by Reece Wooden Sole Shoe Co., Inc., Columbus, Nebr. Of particular interest to contractors is the No. 500 paver's sandal, a thick wooden sole designed to protect workers walking on hot surfaces. The sandal is available in large, medium, and small sizes. It is attached with durable adjustable leather straps.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 57.

Liner-Plate Installation

A new 6-page pamphlet dealing with the installation of vitrified-clay liner plates has recently been released by The Robinson Clay Product Co., 65 W. State St., Akron 9, Ohio, as an aid to construction engineers and contractors. It discusses, in detail, joining, bonding, and anchoring of clay liner plates for concrete pipe and masonry sewers, drains, sewage-treatment tanks, and other projects.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 6.

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Economy . . .
Efficiency

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to DONNELL HYDRO-PAC
ELECTRIC HYDRAULIC LIFT

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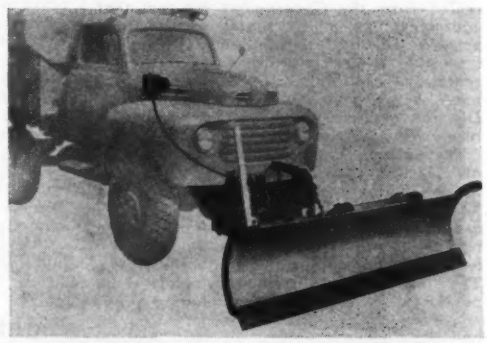

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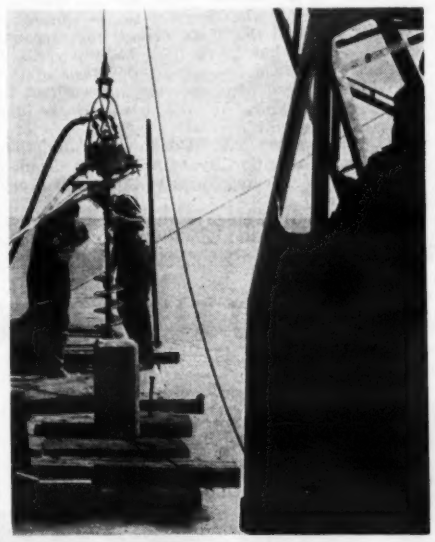

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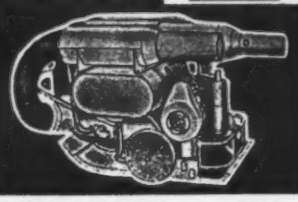

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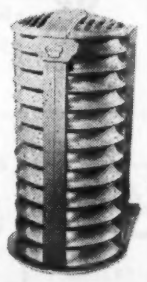

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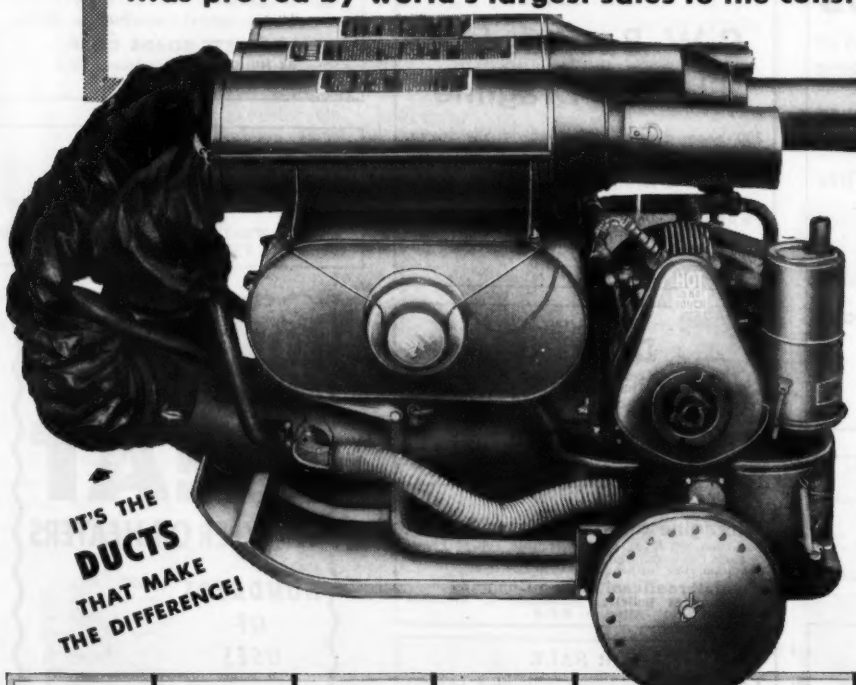

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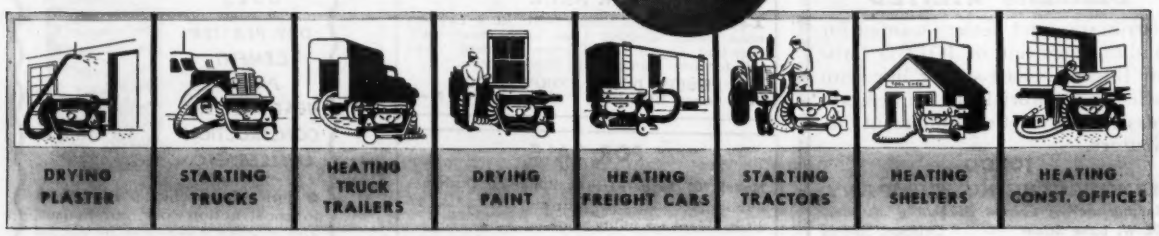

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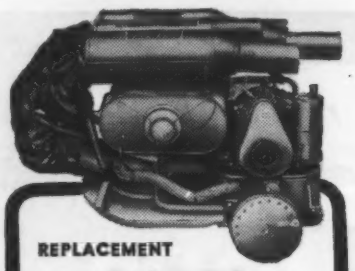

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Price: Reconditioned, $195. New, $295. Originally cost Gov't. about $600.

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2—Int'l. KR11 dump trucks
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In suburban Elkins Park, near Philadelphia, over 450,000 yards of sandy clay are being moved to level a former private estate, stables and racing track, for the Lynnewood Gardens housing project. Orleans Construction Company of Philadelphia, had originally intended to handle the short-haul dirt with a 163 h.p. crawler tractor and 24-yard scraper. Comparing production with a LeTourneau rubber-tired, 7-yard D Roadster, (costing only half as much as the big crawler-scraper rig) they found the smaller, high-speed "D" moved 93 yards an hour to the crawler's 96 yards, *on the same haul!*

Assign 200,000 Yds. to 2 "D's"

As a result, Orleans Construction Company put two utility-size D Roadsters to work as production dirtmovers on stripping, stockpiling and replacing 200,000 yards of topsoil. First month's records show 20,000 yards moved. Later, on established haul cycles, the "D's" stepped production rate way up. For example . . .

1000′ Cycle Every 2.1 Min.

Stripping and stockpiling topsoil on a typically short, 500′ 1-way haul, each Roadster averaged a round trip every 2.1 minutes. Despite 20% approach grade onto top of stockpile, each "D" consistently delivered 24 loads an hour — a total of 48 loads hourly for the 2 fast, rubber-tired "D's" on the tight, 1000′ cycles.

Load in 15 Seconds

On this fast stripping operation, Orleans Construction Co. used a pusher with their "D's" . . . got heaped capacity loads in an average of 15 seconds. The heavy sod and topsoil packed and heaped almost square in scraper bowl . . . averaged over 6 pay yards per load. These fast cycles and oversize loads led Supt. Howard France to comment, "It's amazing how much yardage D Roadsters deliver on a production job."

Report 90% Operating Efficiency

Supt. France further reported that in the first three months of operation, the Roadsters maintained this fast dirtmoving pace *with 90% job efficiency.*

Like Orleans Construction Company, you'll find this fast, rubber-tired D Roadster profitable on short, medium and long hauls . . . productive in fleet operation with a pusher. It's economical, too, as a self-loading unit for one-man dirtmoving on scattered, small-yardage maintenance jobs.

You, too, can move low-cost yardage on your jobs with the 100 h.p., 25 m.p.h. D Roadster. Your LeTourneau Distributor is ready with job-proved facts . . . and will gladly arrange for a demonstration right on your job. Write, or call TODAY!

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